

# The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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## A New Coal and Ore Elevator.

In hoisting coal, ore and other substances by means of endless chains and buckets, a steady movement of the former, without jerking or slipping, is most desirable and of great importance. Chains made of common flat-iron links render such movement very difficult and often impossible, and though a large number of devices have been introduced from time to time, there was still room for further improvements, better contrivances, with a more nearly perfect action, being certain of finding a ready market. With the view of meeting the existing demand, Mr. S. Stutz, of Pittsburgh, Pa., constructed the simple but effective elevator, of which we here give engravings, the apparatus embodying all requisites which insure a continuous and regular working. A side view is given in Fig. 1, Fig. 2 being a partial front view, more clearly showing the minor details, some of which are given on a larger scale in Figs. 3 and 4. The chains, which are composed of malleable iron links connected by pins or by bolts and nuts, are provided with projections, *r*, which regularly and at the proper time are taken up by corresponding teeth, *t*, of polygonal pulleys, *P*, as shown in Fig. 1. The chain is carried around with the pulley, being perfectly secured, no slipping being possible till it arrives at the rear where it is allowed to leave the teeth. Rods, *A* (Fig. 2), reaching across from one chain to the other, support the buckets, *B*, which are kept in place by nuts and pieces of gas pipe, inserted between the buckets and links. The lengths of the latter differ according to the sizes of the former, but in every case they are well proportioned, having large wearing surfaces at their connecting points. The pulleys *P* have independent angle-pieces, carrying the teeth *t*, which are riveted to the separate sides and may be easily replaced in case of accident or when worn out. Should it be desirable, the teeth may be cast in a single piece with the pulley, and in this case advantages are offered in some points, which are, however, perhaps counterbalanced, if not exceeded, by the advantages resulting from the use of separate teeth and pulleys. Pillow blocks, supporting the latter, are fixed upon guide plates, *C*, and can be lowered or raised, if necessary, by means of the set-screws *s*. The elevator here shown is inclined at an angle of 60 degrees, and is provided with half-bushel buckets, fixed to 8-inch links. Motion is transmitted by the pulley *D*, and the material is carried from the bin *G* to the chute *F*. Mr. Stutz has also patented a vertical elevating apparatus, one form of which has quarter-bushel buckets attached to 5-inch links. In this elevator the chute must be placed outside the buckets, allowing free passage for their return, and in order to properly direct the passage of the material, the inventor has introduced a special arrangement of inclined planes fixed to the polygonal pulleys. These planes revolve steadily, and being always in front of the full buckets, receive the material and let it slide into the chute. Elevators of this kind may be employed to raise or deliver material to almost any distance, either horizontal or vertical, as the case may be. Attention should, furthermore, be called to the coal and ore-crushing and washing machinery introduced by Mr. Stutz, who is prepared to furnish all necessary appliances for a complete plant. The prominence of Mr. Stutz in the construction of such machinery as here mentioned and described, is probably the best recommendation for the efficiency and reliability of their action.

## The Legal Status of Express Companies.

In the United States Circuit Court, St. Louis, February 23, Judge Treat read a decree rendered by Judge McCrary, in Chambers, in the case of the Southern Express Company vs. the St. Louis, Iron Mountain and Southern Railway Company. In connection with the decree of Judge McCrary was forwarded the opinion of Justice Miller, on which the decree was based, and on which similar decrees will be made in all the other cases, of which there are quite a number. The decree is dated February 21, 1882, and it orders that the injunction heretofore granted shall remain in full force until otherwise ordered by the court. Justice Miller's opinion is not of great length, and embraces five suits—the Southern Express Company against the "Iron Mountain;" the same against the Memphis and Little Rock Railroad; Wm. B. Dinsmore, president Adams Express Company, against the Missouri, Kansas and Texas Railway; the same against the Atchison, Topeka and Santa Fe Railway; and the same against the Denver and Rio Grande Railway.

Justice Miller, in the document transmitted to Judge Treat, says that the express business is a branch of the carrying trade that has, by the necessities of commerce and the usages of those engaged in transportation, become known and recognized. The general character of the business is sufficiently known and recognized as to require the court to take notice of it as distinct from the transportation of the large mass of freight usually carried on steamboats and railroads, such as grain, flour, iron, ordinary merchandise and the like. It is one of the necessities of the business that the small and valuable packages, &c., carried by the express companies, should be in the immediate charge of an agent or messenger of the person or company engaged in it, and to refuse

permission to this agent to accompany these packages on steamboats or railroads on which they are carried, and to deny them the right to the control of them while so carried is destructive of the business, and of the rights which the public have to the use of the railroads in this class of transportation. When express matter is so confined to the charge of an agent or messenger, the railroad company is no longer liable to all the obligations of a common carrier, but that when loss or injury occurs, the liability depends upon the exercise of due care, skill and diligence on the part of the railroad company. Under the circumstances there does not exist on the part of the railroad company the right to open and inspect all packages so carried, especially when they have been duly closed or sealed up by their owners, or by the express carrier. It is the duty of every railroad company to provide such conveyance by special cars, or otherwise, attached to their freight or passenger trains, as are required for the safe and proper transportation of this express matter on their roads,

insist upon the payment in advance, or at the end of every train, would be to enable them to defeat the just rights of the express companies, to destroy their business, and would be a practical denial of justice. To avoid this difficulty I think the court can assume that the rates or other modes of compensation heretofore existing between any such companies are *prima facie* reasonable and just, and can require the parties to conform to it as the business progresses, with the right to either party to keep and present an account of the business to the court at stated intervals, and claim an addition to, or rebate from, the amount so paid. And to secure the railroad companies in any sum which may be thus found due them, a bond from the express company may be required in advance. When no such arrangement has heretofore been in existence, it is competent for the court to devise some mode of compensation to be paid as the business progresses, with like power of final revision on evidence, reference to master, &c. I am of the opinion that neither the statutes nor con-

in progress the situation is by no means reassuring. On the B. and M. R. Railroad at Omaha the disturbances assumed the proportions of a riot, the militia were summoned to assist the civil authorities in keeping the peace, and one death has already resulted from collision between those who are attempting to enforce and those who are violating the law. In Lawrence, Mass., a large strike is in progress among the mill operatives; the cause, an attempted reduction in wages. In Fall River the wage question is the theme of discussion before the spinners' union. There are rumors of a strike at Troy among the stove molders, and one has but recently been settled at Pittsburgh. In the building trades there is a feeling of discontent all over the country, and demands for 20 to 40 per cent. advance in wages over those paid last year are by no means uncommon. It may be said in passing that this demand is having a tendency to check building operations.

Part of this movement is no doubt due to the approach of pleasant weather. As we

need of a large number of glass tubes, and since this article was exceedingly dear in France at the time, and the duty on imported glass tubes was something alarming, Humboldt sent an order to Germany for the needed articles, giving directions that the manufacturer should seal the tubes at both ends, and put a label upon each with the words "Deutsche Luft" (German air). The air of Germany was an article upon which there was no duty, and the tubes were passed by the custom officers without any demand, arriving free of duty in the hands of the two experimenters.

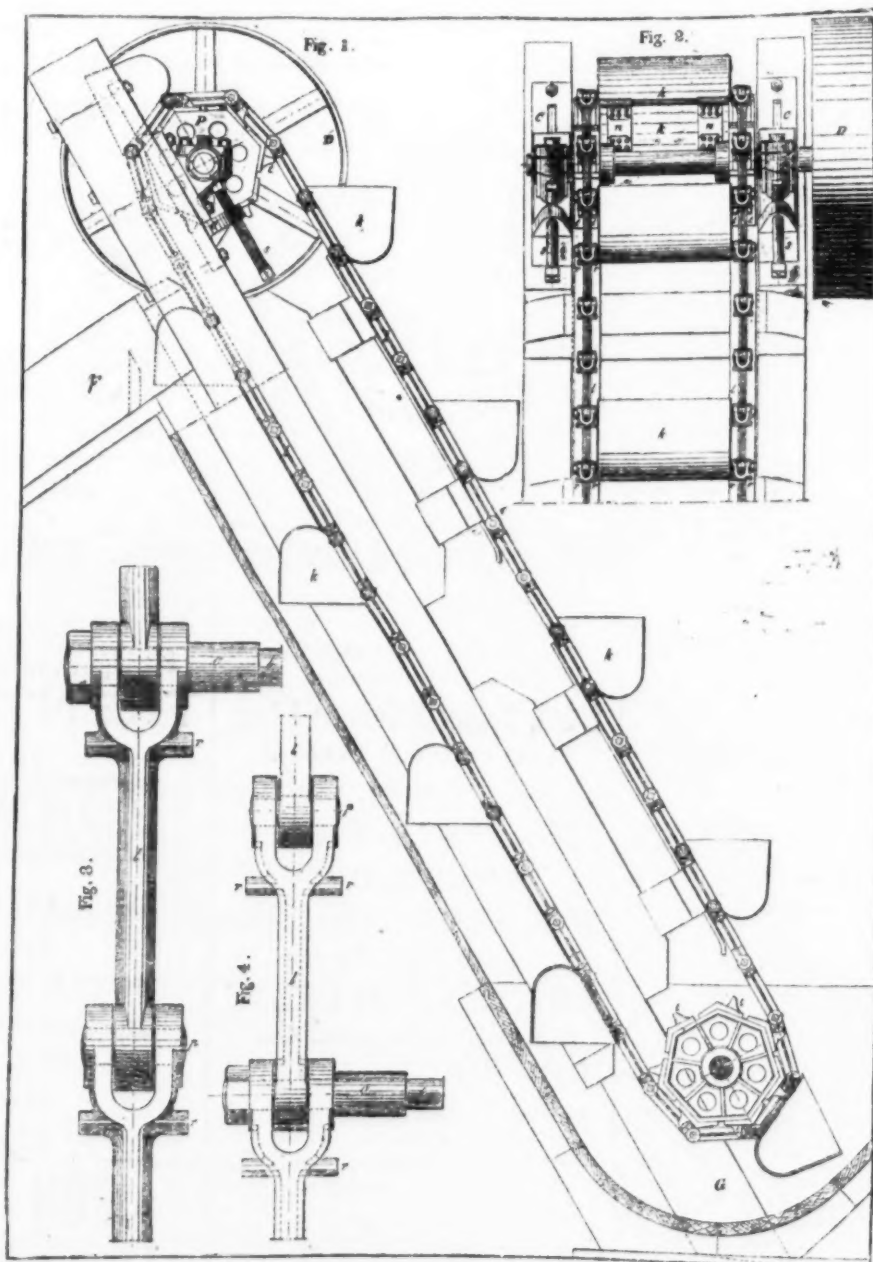
## The Paris World's Fair of 1875.

Two large volumes have just been laid before the French Chambers, containing the accounts of the Paris Exposition of 1875. They will be found of absorbing and melancholy interest by the taxpayers, as, instead of a deficit of \$2,000,000, one of more than thrice that sum has to be made up. Some of the statistics presented are worth preserving. There were 16,102,089 visitors to the Exposition, against 9,062,965 in 1867, and the receipts from admissions were \$2,675,927.68, while the concerts brought in \$14,489.20, and the sale of the catalogue \$23,722.47. (The catalogue never was completed thoroughly, owing to the neglect of some of the foreign commissions.) The sale of materials produced \$688,177.97, and, with the sale of privileges, the subsidy from the city of Paris, &c., the total receipts were brought up to \$4,870,000, or nearly \$200,000 less than the estimates. The expenditure was estimated at \$7,062,600, but it went up to \$11,155,000, owing to the unexpected success of the project. The cost of direction and attendance was more than doubled, that of the building was increased by nearly \$1,000,000, and so on all along the list. There were 52,835 exhibitors in all. Of the 26,963 from foreign parts, Spain led with 4583; then came Austria and Hungary with 3983, and England with 3184; Japan sent 430 and China 436. There were awarded 29,810 medals and diplomas and 251 premiums for fatted cattle. The cost of the aquariums and cascades was \$560,000, of water elsewhere and gas \$182,800. There were reported 175 thefts, nearly all of which were insignificant, and 130 of the rascals were arrested. Of these 96 were French, 14 Italians, 5 Turks or Syrians, 4 Spaniards and 4 Englishmen, a showing which should suffice to explode that famous legend of "hundreds of English pickpockets" looking to Paris. Though there is a deficit of \$6,285,000 to be met, the Exposition need not necessarily be regarded as a losing speculation even for the Government. The lodging-houses received during the time the Exposition lasted 218,622, or thrice the usual number; the five great lines of railroad carried to Paris 12,154,905 travelers, an increase of 2,602,491, and the receipts of the "bus" and penny boats were greatly increased. The receipts of the theaters for the year were \$3,714,600.

## Blast Furnaces in Sweden.

Down to the commencement of this decennium there was only one place in Sweden where two blast furnaces were in operation at one time, the materials being, as a rule, insufficient to keep even a single furnace in uninterrupted working during the whole year, owing to the difficulty of collecting charcoal and ores. All the necessary material must be brought to the furnaces on sledges, and the former are, in consequence, generally not blown in until sledding can commence. The longer the snow lasts, the larger is the stock of materials which an ironmaster can lay in, and it will, therefore, readily be seen that the length of time during which the furnaces are kept in blast depends, in a great degree, on the nature of the winter. It is possible in only few places that a sufficient quantity of charcoal and ore may be stored to keep the furnace going till the sledding season again commences, and they are, therefore, generally blown out in the middle of the summer. There are, however, exceptional instances of furnaces having been kept in blast from three to six years. Lately, however, as the means of transport have improved by railway communication, &c., new blast furnaces have been erected, so that there are now in some places two and in others even three in operation. Through improved means of transport the production of pig iron in Sweden has naturally become less dependent on the quantity of snow which falls in the winter; still good sledding is even now a principal condition for an increased production of iron, as the charcoal kilns in the interior of the forests are only accessible when the water courses are covered with ice, and the snow renders the trackless forests passable. It is, accordingly, only during such a time that charcoal can be got out to railways or other lines of communication. The furnace workmen are generally paid by piecework, and a foreman is said to earn, as a rule, from 40 to 75 cents per day, while an ordinary workman receives from 30 to 60 cents. The cost of labor for the making of pig iron varies somewhat, but is generally about 6 cents per cwt., or about \$1.50 per ton, which includes the cost of calcining and crushing the ores.

It is reported that Krupp has added 8000 recruits to his industrial army, which now numbers 40,000.



STUTZ'S COAL AND ORE ELEVATOR.

and that the use of these facilities should be extended on equal terms to all who are actually and usually engaged in the express business. If the number of persons claiming the right to engage in this business at the same time on the same road should become oppressive, other considerations might prevail; but until such a state of affairs is shown to be actually in existence in good faith, it is unnecessary to consider it. This express matter and the person in charge of it should be carried by the railroad company at fair and reasonable rates of compensation, and where the parties concerned cannot agree upon what that is, it is a question for the courts to decide. A court of equity, in a case properly made out, has the authority to compel the railroad companies to carry this express matter and to perform the duties in that respect already indicated, and to make such orders and decrees and to enforce them by the ordinary methods in use necessary to that end. The learned justice says: "While I doubt the right of the court to fix in advance the precise rates which the express companies shall pay and the railroad companies shall accept, I have no doubt of its right to compel the performance of the service by the railroad company, and after it is rendered to ascertain the reasonable compensation and compel its payment. To permit the railroad company to fix upon a rate of compensation which is absolute, and

stitution of Arkansas or Missouri were intended to affect the right asserted in these cases; nor do they present any obstacle to such decrees as may enforce the rights of the express companies."

## Labor Troubles.

With the return of spring there is a manifest increase in the number and importance of strikes. In the iron trade the most important one is that at Homestead, near Pittsburgh, at the works of the Pittsburgh Bessemer Steel Company, Limited. At this place a spirit of lawlessness has existed, and men and officers have been brutally beaten and shot at while in the discharge of their duty. It is asserted by the union that the men guilty of these outrages are not unionists, and we do not believe that the better men of the union are cognizant of them, but that some of the strikers are the perpetrators seems evident. Indeed, one striker has just been convicted of assault. In the coal regions an extensive strike of 3000 miners has just been inaugurated at Cumberland, Md., against a reduction of wages, and 200 mines are idle. In Ohio meetings are held by the miners that look to a stoppage of work. In the Lehigh district of Pennsylvania the men have been reduced to half time, and consequently half wages, and though no strike is

have already often stated, it is not the policy of workmen to strike in winter if it can be avoided. Work is scarcer, fuel, clothes and food higher, and a larger quantity necessary than in summer or even in spring. A part is due to the necessity in many cases of additional wages. It is no doubt true that wages have not followed the advance in prices of products and of living as closely as they might. But the chief indication of these labor movements is of an unstable equilibrium in business. Some of these strikes are for an advance, some against a reduction. If all or most were one way it would indicate a decided tendency of business up or down, but with a divided tendency it shows an uncertainty, a lack of definitives that indicates doubt as to the future—in a word instability. These indications cannot be ignored by either side. The situation is one that calls for wisdom, not passion; cool, deliberate judgment, not hasty, ill-advised action.

A German newspaper some time ago related an amusing story of the famous scientist, Alexander von Humboldt, who took advantage of the exemption from duty of the covering of articles free from duty, formerly the rule in France. In the year 1805 he and Gay-Lussac were in Paris, engaged in their experiments on the compression of air. The two scientists found themselves in

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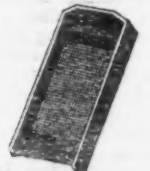

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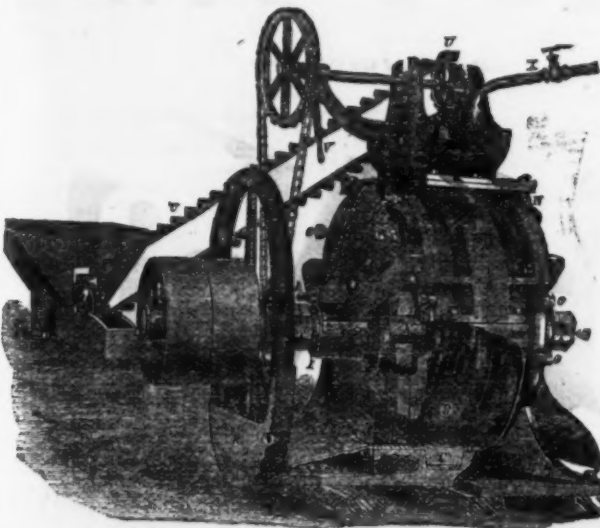
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**Universal Cooking Crock.**

The accompanying cut represents a novelty in the shape of a cooking utensil, which in itself combines all the advantages of a metal vessel with those of the article of porcelain-lined metal. It also has many desirable points of its own. It is called the Universal Cooking Crock, and consists of a crock or earthenware vessel set into a band of sheet metal, which supports its bottom within perhaps 1/4 inch of the surface of the stove. The crock itself is of a peculiar kind of earthenware, glazed upon the inside in a manner similar to the chemical ware used by druggists. The cut shows a half section of the vessel as it would appear when sitting upon a stove. It will be observed that the crock flares, which makes an air space between its side and the surrounding Russia iron sheath. This protection, it is said, makes the crock a better heater than a similar vessel sitting directly upon the stove surface, but without the sheath. This construction has one very peculiar advantage in that it is said to be impossible to burn food cooked in such a crock. This does not mean that if food, like oatmeal or cracked wheat, is allowed to dry thoroughly it will not burn, but simply that it will not "burn on the bottom" while there is any respectable degree of moisture remaining. The efficiency of a double bottom was long ago

that was going on at Gatun can hardly matter a great deal. The few small houses that were going up there can be finished at any time; some of them are already finished.

**Thermometers for Low Temperatures.**

Experiments made at the Meteorological Observatory at Kew, England, have shown that ordinary thermometers are very inaccurate below the freezing point of water, and that the low temperatures announced as having been produced by refrigerating machines for freezing meat on board ocean-going steamers are liable, in many cases, to serious questioning. Some of the thermometers have been found to be inaccurate to the extent of more than 50° F., and one was 100° out. A thermometer, a relic of one of the earlier Arctic expeditions, was recently tested at Kew. At -40° F. it was 15° out, and at -100° F. it was 30° wrong. The demand for trustworthy thermometers for circumpolar and northern meteorological stations, as well as for meat-freezing machines and various scientific purposes, has induced the authorities at Kew to test the instruments at the temperature of melting mercury, the air thermometer being used for lower temperatures should exceptional circumstances require it. The freezing point of mercury -37.9° F., was first determined by Dr. Balfour Stewart, and his



Universal Cooking Crock.

demonstrated in a most conclusive manner by Count Rumford, who made very many successful cooking utensils, both of large and small size, in this way. The Universal cooking crock, though not having a double bottom, actually applies the same principle of an air space beneath the crock, making the heating surface of the stove perform the part of a lower bottom. To prevent the cracking of the crock it must never be placed directly over the fire, as this will practically defeat the purposes of the invention, and at the same time expose the crock itself to such a test as no earthenware can be expected to bear. The article is manufactured by the Universal Cooking Crock Co., 9 Burling Slip, New York.

**Work on the Panama Canal.**

A Panama letter of February 11th to the New York Herald, gives a desponding account of operations by the Lesseps Canal Company. The writer says: Going back to the beginning of last year I cannot help thinking that if the company are in earnest about pushing the work excavations might now be progressing on a large scale, instead of which there is, in reality, nearly next to nothing done. Some material has been brought out and dumped on the beach. A few small houses are being erected at Gatun, Emparador and one or two other points. The Grand Hotel has been purchased and filled by officials. The expensive toy of a fancy hospital is going up, the engineers are still studying the ground, and this is about all that has been accomplished with the first \$15,000,000 of the shareholders' money. At this rate 1,000,000,000 francs will not half build the canal. It has been shown, however, that out of his first \$60,000,000 M. de Lesseps, after paying off outstanding scores, will have only \$12,500,000 to work with. Supposing that he does get the loan of an equal amount, this would make but \$72,500,000, and even he, sanguine as he is, does not contend that this sum would suffice to finish his task. Where, then, is the difference between this sum and the \$140,000,000 which he says he needs to come from? This difference is only a small item of \$67,500,000. Admitting that all the first \$60,000,000 be paid up, a thing which is by no means certain, it is hard to believe that the shareholders will consent to mortgage their interests in favor of parties who, up till now, have risked nothing, in order to get a second \$60,000,000 to carry the enterprise through, although if they did make such a sacrifice it would avail them nothing. The situation is, therefore, becoming difficult, and men who find themselves embarked in the speculation will be likely to consider that their best way out is to leave it now.

From the company's officials it is impossible to find out whether or not the second call for 125 francs per share, payable between January 2 and 15 of this year, has been fully responded to. I am informed, upon what seems good authority, that the call has been only partially successful. My informant has assured me that the King of the Belgians has withdrawn himself from the enterprise. His Majesty was one of the heaviest shareholders in it. The same party also states that many of the shareholders' friends, who were sent out to fill positions on the isthmus, wrote home very discouraging accounts as to how things were going on, and that these stories had a disastrous effect upon the company's financial prospects. As if to confirm this piece of evil news for the company, I hear that they have suspended the work at Gatun under the pretext that the Huerte, Slaven & Lynch contract will cover that point. This contract has not been signed up till the present, but there can hardly be any doubt that it will go into effect. At all events, the suspension of the very little work

observations were subsequently confirmed by other observers. Between the freezing points of water and mercury no intermediate fixed point is known, although methyl chloride is supposed to furnish one. It is difficult to get this chloride in a solid state.

At a recent test of a thermometer to be used with meat-freezing apparatus, about a pint of mercury was poured into a wooden cup, which was covered with boiler felt besides having an outer covering of wood. Solid carbonic acid was made in the usual way, by the evaporation of some of the liquid carbonic acid from an iron bottle, into which 200 gallons of the gas had been compressed. Lumps of the solid acid were then placed on the surface of the mercury, a little sulphuric ether was poured over them, then the lumps were pressed down into the mercury with a wooden spoon. This produced a hissing and a bubbling from the escape of carbonic acid gas. After the operation had been several times repeated, lumps of solid quicksilver began to form; some of them, rich in gas bubbles, floated at the top; others sank to the bottom, for mercury, unlike ice, is heavier than the liquid in which it is formed. The lumps, some of them hard and some soft, were constantly broken up as much as possible with the wooden spoon, the great object being to get a thick layer of soft mercurial paste at the bottom of the vessel, in which to plunge the thermometers during the observations. The whole operation appeared to the onlookers to be simple and easy enough, although in the last generation the freezing of even a small piece of mercury was considered a wonderful feat. Four standard Kew thermometers were then placed in the mercurial paste, and those to be tested were inserted alongside, their errors in indication being written down on paper. The possibility of all four of the Kew thermometers going wrong at once is not to be supposed, consequently the values of the indications of the thermometers on trial are well tested.

**Large Slotting Machine.**—An exceptionally powerful slotting machine, especially designed for marine-engine work, has recently been completed by Messrs. Craven Brothers, of Manchester, England. The total weight of the machine is 70 tons, and the maximum stroke of ram is 10 feet, with a minimum stroke of 9 inches. The distance from the face of the ram to the frame is 6 feet 6 inches, and the total height from ground line, when working its longest stroke, is 30 feet. The machine can be worked at equal speed in the cutting and return strokes, or the return stroke may be accelerated to double that of the cutting stroke when the work will admit. The self-acting motions are all variable from four to sixty-four cuts per inch, and besides these, the slides and rotary table can be moved in either direction by power, at the rate of 8 feet per minute.

In an official report by Mr. Edward Atkinson and Mr. William B. Whiting, of Boston, they mention with much satisfaction the fact that more attention is now being paid to careful construction of buildings. They also state that the old stock of combustible churches, hotels, schoolhouses, hospitals and asylums is being consumed at an unusually rapid rate. In previous years this destruction has been at the rate of one church per week, and one hospital, almshouse, insane asylum or schoolhouse per month. In 1881 this was very much exceeded. In their concluding remarks they appear to think that if this rate is kept up for a few years longer, a salutary lesson will be taught, the old stock of combustible buildings be reduced and a new stock take their place more in accordance with our present knowledge of the law of fire-proof construction.

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Quality and efficiency fully guaranteed. Prices as  
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Manufacturers of the Keystone Patent Solid  
Steel Calk Horse and Mule Shoes.  
These Shoes are made of superior iron and steel,  
completely finished and ready for cold shoeing;  
have clip and solid steel calks. The holes are  
punched through at the proper angles and free  
from burrs. Same number of Shoes per keg as in  
kegs of unfinished shoes.

**The Crown Point Furnace.**  
In a recent letter to the Secretary of the  
American Iron and Steel Association, Messrs.  
Taws & Hartman, of Philadelphia, state  
that the Crown Point Iron Company, of  
Crown Point, N. Y., have enlarged their No.  
2 furnace and run it for five weeks. The  
furnace is equipped with new regenerative  
stoves and a new blowing engine, the latter  
being different from any heretofore built. It  
is a vertical condensing engine with a blow-  
ing cylinder 90 inches in diameter, and a  
steam cylinder 72 inches in diameter, the  
stroke being 7 feet. The size of the steam  
cylinder is unusual, but it is the cause of its  
economy in steam, this being shown by the  
existence of a surplus of the latter, a thing  
that never before occurred with the same  
burden. The maximum pressure blown for a  
short time was 23 pounds per square inch.  
The engine has been run with 18 pounds con-  
tinuously for 12 hours without the journals  
heating or the engine showing signs of over-  
work. The engine was built by the I. P. Morris  
Co., of Philadelphia, and is fitted with Wan-  
ich's patent poppet valves, which effectually  
prevent the breaking of cross-heads or steam-  
cylinder heads by water. The capacity of  
this engine is 12,000 feet of air per minute,  
and it is guaranteed to blow 20 pounds to the  
inch. When blowing 12,000 feet of air per  
minute at 8 pounds pressure only one-third  
of the power of the engine is derived from  
the boilers. The other two-thirds are derived  
from the vacuum produced by condensation,  
which practically costs nothing. This makes  
it the most economical blowing engine on  
record. With a given size of blowing cylin-  
der, say 90 inches, and a steam cylinder 45  
inches (which is the proportion generally  
used), and blowing 8 pounds per square inch,  
more steam will be used and less vacuum  
power will be obtained than with a 72-inch  
steam piston. More water is required for  
condensation with a 45-inch piston than  
with a 72-inch piston when the same power  
is developed.

Experience shows that surface condensers  
attached to blowing engines produce a better  
vacuum than the old jet condensers. The  
surface condensers add 10 per cent. to the  
cost of the engine, but they keep the boilers  
clean, thus preventing the frequent stop-  
pages for cleaning. With the modern rapid  
driving of blast furnaces the pressure of  
blast has steadily increased, requiring larger  
and more powerful blowing engines. When  
from any cause the balance of heat in the  
hearth of a furnace is lost the pressure of  
blast increases rapidly, and unless there is  
sufficient power in the blowing engine to  
force the blast through the stock, the fur-  
nace must go through a siege to restore the  
heat to the hearth, or it must be shoveled  
out. Since regenerative stoves have come  
into use the amount of fuel used to the ton of  
iron made has decidedly decreased. This  
decrease of fuel makes the escaping gas from  
the furnace poorer in carbonic oxide, and it  
consequently has less heating power. As  
the pressure of blast has increased, as above  
stated, more gas is required than heretofore  
to generate the steam to give this increased  
pressure, while the gas at the same time is  
poorer in burning power. This extra re-  
quirement is partly met by the use of eco-  
nomical condensing engines, but principally  
by the great saving of gas in the use of re-  
generative stoves. It takes no more gas to  
heat the same volume of air 1200° in a re-  
generative stove than it takes to heat it 900°  
in the cast-iron stoves. The escaping gas  
from iron pipe stoves is about 1800°, while  
the escaping gas from regenerative stoves is  
about 400°. In the event of a loss of heat in  
the hearth regenerative stoves will heat the  
blast hotter, which will quickly restore the  
heat to the hearth if the blowing engine is  
powerful enough to force the blast through  
the furnace.

Our iron shipbuilding yards are all fully  
occupied, inasmuch that some of them can-  
not for the present accept further contracts.  
At Chester, Mr. Rouch employs about 1800  
men, and has seven or eight vessels on the  
stocks. Messrs. Cramp & Sons have five or  
six vessels in progress. At Wilmington,  
Del., the same activity prevails. The Har-  
lan & Hollingsworth Company employ about  
1500 men, and are about laying three more  
keels, including one for a steamer of 4000  
tons, and the Pusey & Jones Company have  
six steel and iron steamers under way for  
South America. Any of those firms can put  
up a ship ready for launching in four months.  
With remunerative freights in the American  
merchant marine, the Delaware River would  
soon become another Clyde. It is fortunate  
that an influential committee in Congress,  
whose business it is to report respecting the  
expediency of finishing the five naval iron-  
clads now rusting on the stocks, have had an  
opportunity to learn what is going on.

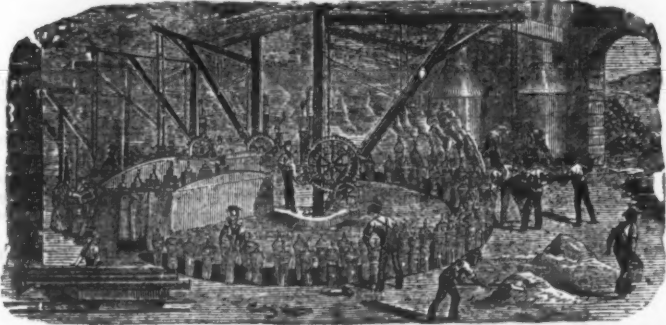
Experiments designed to show the effi-  
cacy of oil in allaying a troubled sea, have  
recently been conducted at Peterhead, Eng-  
land, and other fishing ports, with most sat-  
isfactory results. At the time of the experi-  
ments the wind blew from the southeast, and  
the waves were so high, and broke with such  
force, that the signal indicating danger to  
boats crossing the harbor bar was hoisted,  
while a tug boat, with a vessel in tow, had to  
"stand off." On the waters thus agitated  
the oil was spread from three submarine  
valves, on piping ranged along the sea floor,  
to the extent, it is said, of only two or three  
gallons, and, in the course of half an hour  
the whole expanse of water, from the tidal  
run to the harbor entrance, was coated with a  
uniform film of oil. Over this expanse the  
waves, although advancing at their full  
height outside the bay, ran their course in  
gentle undulations, the tug and its attendant  
vessel, meanwhile, passing safely in and  
other boats gliding safely out of the harbor.

Les Mondes reports that M. Dufourcat has  
in the exposed court of his house two bars of  
iron planted in the earth, to each of which  
is fixed a conductor of coated wire, terminat-  
ing in a telephonic receiver. He consults the  
apparatus twice or thrice every day,  
and it never fails through its indications of  
earth currents to give notice of the approach  
of a storm twelve to fifteen hours before it  
actually arrives.

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General Foundry Work.



Flange Pipes.

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FOR WATER AND GAS.

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Warranted Equal to any Produced.

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For Edge and Turning Tools, Taps, Dies, Drills, Punches, Shear-Knives,  
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**SAW PLATES**  
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**Sheet Steel**  
For Springs, Billet Web and Hand Saws, Shovels, Cotton Gin Saws,  
Stamping Cold, &c., &c.

**SIEMENS-MARTIN (Open-Hearth) PLATE STEEL**  
For Boilers, Fire-Boxes, Smoke Stacks, Tanks, &c.

All our Plate and Sheet Steel being rolled by a Patented Improvement is unequalled for surface  
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"Iron Center" Cast Plow Steel. Finished Rolling Plow Coulters with Patent Screw  
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## THE MIDVALE STEEL COMPANY,

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### TIRES and AXLES

OF EVERY DESCRIPTION.



Tool, Machinery and Spring Steel  
Castings and Forgings.

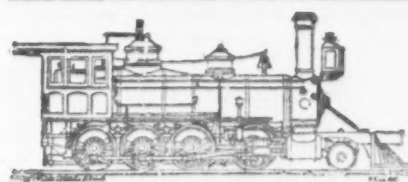
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**LOCOMOTIVE ENGINES**  
of every Description.

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**NOISELESS STEAM MOTORS,**  
For city and suburban Railways.

These machines are nearly noiseless in operation; show no smoke with the use of anthracite  
coal or coke as fuel, and show no steam whatever  
under ordinary conditions of service. They can  
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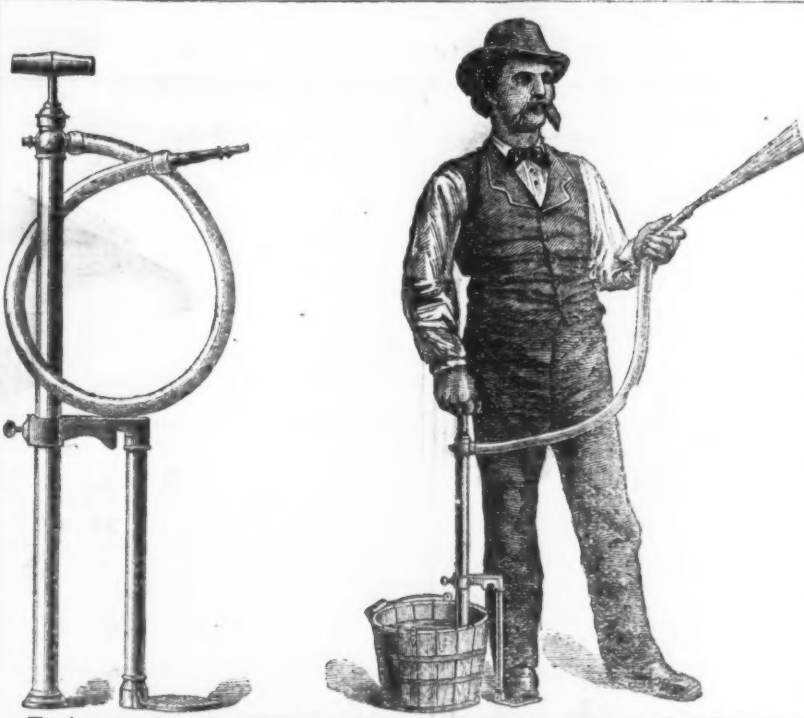
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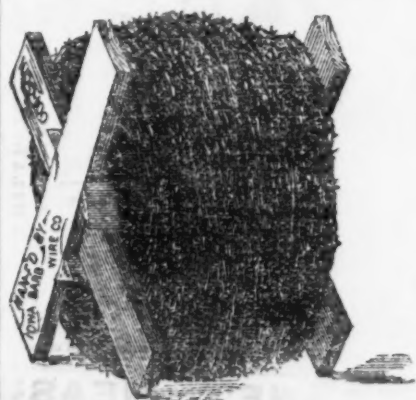
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## METALLURGICAL NOTES.

### PROPERTIES OF MALLEABLE NICKEL.

We have on previous occasions noted the  
efforts which have been made from time to  
time to manufacture malleable nickel. M.  
Garnier, of Paris, claims to have succeeded  
in making malleable nickel by the addition  
of 0.3 per cent. of phosphorus or manganese.  
Credit is also due to Mr. Fleitmann, of Saarbrücken,  
Germany, for considerable work done in this  
direction. He adds 1-10th to 1/4 per cent.  
of magnesium, and has found that he can  
weld the nickel thus obtained to iron and  
steel and roll it out in sheets, and shape it  
into tubes and pipes. Dr. Collmann has  
made a series of tests of the solid malleable  
nickel produced by the Fleitmann process  
with the following results: A 0.465 inch  
round bar showed a limit of elasticity of  
59,741 pounds, a tensile strength of 96,083  
pounds, with an elongation of 17 per cent.  
and a contraction of area of 50.6 per cent.  
A second one, 0.44 inch in diameter, had  
an elastic limit of 40,609 pounds, a ten-  
sile strength of 78,957 pounds, an elongation  
of 20.25 per cent. and a contraction of area  
of 45.5 per cent. Nickel wire, 0.01615 inch  
in diameter, broke under a load of 1565  
pounds.

### A NEW QUARTZ CRUSHER.

Another addition has recently been made  
to the long list of quartz-crushing contriv-  
ances now in the market. It is the inven-  
tion of Charles P. Stanford, of San Francisco,  
and consists of a circular flat-bottomed mor-  
tar, properly secured to a foundation or  
mortar block. Within this mortar is the  
crusher or pestle, this being a heavy metal  
block, having peripheral dies securely bolted  
to its under surface. The mortar is large  
enough to easily contain the pestle, besides  
allowing considerable play. The frame of  
the contrivance is provided with cross guides,  
in which a vertical shaft is properly sup-  
ported. This shaft has secured to it a crank  
arm, through the outer end of which the  
stem or handle extending upward from the  
pestle loosely passes. Since the shaft is  
directly over the center of the mortar each  
revolution causes the stem of the pestle to  
describe a circle outside of its vertical cen-  
tral line, thus tilting the pestle upon each of  
its dies successively, causing a crushing and  
grinding of the material. The whole weight  
of the pestle is thrown upon each die as it is  
tilted by the revolving crank, and as the  
faces of the dies are made in a plane tangen-  
tial to the radial line of the movement of the  
pestle, a series of flat surfaces of the dies,  
parallel to the flat bottom of the mortar, in-  
termittently strike the ore percussively.  
The stem, by passing loosely through the  
crank is not revolved upon its own axis, and  
consequently the pestle does not turn in the  
mortar.

### CAESIUM AND RUBIDIUM.

A careful study of some new caesium and  
rubidium compounds was recently made by  
Carl Setterberg, who succeeded in preparing  
metallic caesium from the chloride by means  
of electrolysis. The material was obtained  
by working up residues from the preparation  
of lithium compounds from lepidolite, large  
quantities of this material being at his dis-  
posal. The separation of pure salts was  
effected as follows: Three to four hundred-  
weight of the impure alums (the residues just  
mentioned) were dissolved in enough water  
to make a solution of 20° B. when boiling.  
The deposit from this solution contains all  
the rubidium and caesium compounds. This  
operation is repeated until the potassium  
alum is removed. Then the crystallization  
is continued and rubidium alum obtained  
in pure condition. Finally, the caesium  
alum is obtained. Thinking that possibly  
other alkaline metals might be contained in  
the mixture, the crystallization of the cae-  
sium alum was continued until only a very  
small quantity remained. No evidence of  
the presence of new metals was obtained.  
Mr. Setterberg prepared, in the course of  
two weeks, some 88 pounds of rubidium  
alum and 22 pounds of caesium alum. Ru-  
bidium was prepared by distilling, after car-  
bonizing, 3300 pounds of rubidium dicitrate,  
330 pounds of calcium carbonate, and the  
necessary quantity of sugar. The operation  
was in every respect satisfactory. The at-  
tempt to prepare metallic caesium by re-  
duction of the carbonate with charcoal was not  
successful. By electrolysis of caesium cy-  
anide, however, the metal was obtained,  
though only in small quantity. It was found  
better to use a mixture of four parts caesium  
cyanide to one part barium cyanide, instead  
of pure caesium cyanide. Caesium is very  
similar to the other alkali metals floating on  
water, and acting like potassium and ru-  
bidium as regards the accompanying pheno-  
mena.

### ELECTRO-DEPOSITION OF TIN.

Improvements have recently been made in  
connection with the manufacture of tin  
plate with the view of reducing to practice  
the tinning of the plates by electro-deposi-  
tion of the metal. In carrying out the im-  
provement the inventor takes what are  
known as "black plates" which have been  
"pickled," annealed, cold rolled and again  
"pickled" preparatory to being tinned.  
These plates having been properly cleaned,  
are immersed and rinsed in a basin of clean  
water, and are then passed into the deposi-  
tion bath, being suspended from a rack frame  
or dipping apparatus. The bath being  
charged with plates, a dynamo-electric ma-  
chine is set to work and tin will be deposited  
upon the plates, the thickness of the deposit  
varying according to the strength of the  
current and the time of immersion. A  
specially constructed resistance coil is put in  
the circuit to regulate the strength of the  
current. When sufficient tin has been de-  
posited the plates are removed from the bath,  
rinsed in hot or boiling water, and passed  
into hot (hard wood) sawdust to dry the sur-  
face, and for most practical purposes these  
plates are bright and lustrous enough with-  
out further treatment. If it be desired to  
give the plates the appearance of frosted  
silver, they are passed through fine wire  
scratch brushes, but for giving a burnished  
surface either a set of scratch brushes and  
final buffing rolls are employed or two sets  
of scratch brushes and a burnishing tool.  
The apparatus for this polishing or finishing  
purpose consists of a bed-plate mounted upon  
suitable standards or framing. At the head

of the machine are bearings for carrying  
and gear for driving a pair of cross shafts,  
to be fitted with fine wire scratch brushes,  
and at the opposite end of the machine a  
second pair of shafts for scratch brushes,  
with corresponding gearing, may be fitted or  
not, according to the finish to be given to  
the plates. After the first pair of scratch  
brushes the plate in its passage through the  
machine comes on to the bed-plate, which  
has a polished steel surface; above this is  
arranged in reciprocating slide bearings a  
burnishing steel bar of rounded surface form,  
to which a rapid to and fro motion is im-  
parted across and upon the surface of the  
plate under treatment, and strong lye water,  
or other emulsive or softening liquor to facil-  
itate the burnishing action is dropped upon  
the plate during the progress of the work.  
Plates having a deposit of so small a quan-  
tity as 10 ounces of tin to the "box," that  
is, a box of 112 sheets, 20 x 14, treated by  
this scratch brushing and burnishing ma-  
chine receives a surface and finish of bril-  
liant, lustrous and continuous metal—that is,  
the action of the burnishing tool upon the  
deposited surface presses out and together  
any infinitesimal pores in the deposited metal  
of the coating, so that the fiber of the metal  
is perfect in its continuity, while the luster is  
perfect. Instead of this mode of treatment,  
a fair result can be obtained by passing the  
tinned plates through polished steel or chilled  
iron rollers running at speed in opposite di-  
rections or at differential speeds. The plates  
may also be finished by subjecting them to  
heat sufficient to float the metal on the plates.  
It has been found in practice that one of the  
improved "Elmore" dynamo-electric ma-  
chines will deposit the tin on about 500  
"boxes" of plates, 21 x 14, per week. The  
economy, simplicity and efficiency of this  
process will, no doubt, be readily apparent  
to those who best know the wastefulness of  
the primitive dipping process.

### VIRGINIA EXPERIMENTS IN COKE-MAKING.

It is reported that an enterprise of more  
than ordinary interest has been started in  
Virginia. American iron manufacturers are  
generally of the opinion that coke made in  
bee-hive ovens is superior for blast furnace  
purposes to that made in more modern appli-  
ances. The Iron and Steel Association of  
Virginia has resolved to test the matter, and  
it is now putting down a plant of eighty of  
Soldenhoff's modification of the Coppée coke  
oven, of which a large number are in opera-  
tion abroad. Hawk's Nest coal from Gauley  
Mountain is to be coked, the builder guar-  
anteeing that 95 per cent. of the carbon in  
the coal is to be converted into coke. It is  
stated that the cost of the plant is only 35  
per cent. greater than that of a line of bee-  
hive ovens of equal capacity.

Mr. Pattison Muir gives this method for  
detecting tin in the presence of antimony.  
It is based on the fact that stannic chloride  
is reduced to stannous chloride by boiling  
with metallic copper. The precipitated sul-  
phides of the arsenic group are warmed with  
concentrated hydrochloric acid. The insol-  
uble portion is washed and tested for arsenic  
by Bunsen's film test. The solution is some-  
what diluted; about three-fourths of it is  
boiled for at least ten minutes with copper  
turnings (which must, of course, be free  
from tin), poured off from the copper, and  
tested for stannous chloride by adding mer-  
curic chloride. The remaining smaller por-  
tion of the solution is poured on to a plate of  
platinum, surrounded by a piece of zinc-foil.  
If the platinum becomes covered with a black  
deposit it is removed and examined in the  
ordinary way.

In a recent issue of the *Railway Age* it  
was stated that 14 years ago the first steel  
rails in America were laid on the Pennsylv-  
ania Road, near Pittsburgh. In reply to  
this, President Hinkley, of the Philadelphia,  
Wilmington and Baltimore Road, says:  
"The Philadelphia, Wilmington and Balti-  
more Railroad Company laid 26 tons of John  
Brown Bessemer steel rails in August, 1864,  
or 18 years next August, and laid more or  
less every year since. The greater part of  
those 26 tons are still in the track." Mr.  
Hinkley's statement that the rails made  
almost 18 years ago are yet doing service on  
the road is interesting. We should be glad  
to note the results of careful chemical and  
physical tests, as they would have an im-  
portant bearing on points now in dispute.

An English exchange states that the quan-  
tity of coal raised in the United Kingdom  
during the year 1881 exceeds that raised in  
1880 by over 1,000,000 tons. The quantity  
raised in 1880 was 146,818,622 tons, and it  
was far in excess of the production of any  
previous year, the next largest production  
being that of 1877, which was 134,610,763  
tons. It was not till 1875 that the great in-  
crease in the capital employed in collieries,  
resulting from the high prices for coal ruling  
in 1872-73, began to make itself felt. In  
1873 the production was 127,016,747 tons,  
and in 1875, 131,867,916 tons.

It is said that the Shah of Persia has  
granted to a French company a concession  
for the construction of a railway from  
Teheran to Resht, on the Caspian Sea. The  
work of construction is to begin in July of  
this year, and to end in 1884. The company  
is to pay about \$1,000,000 on the opening of  
the line, besides a rent of about \$10,450  
yearly for the period of the concession,  
which is sixty years. In this country they  
would want \$1,000,000 bonus, and a guar-  
anty of 6 per cent. on their bonds for sixty  
years.

Plans for Lawler's railway pontoon bridge  
to cross the Mississippi River at Reed's Land-  
ing for the Chippewa Valley and Superior  
Railway are now being prepared at Milwa-  
ukee. The bridge is to be similar in construc-  
tion to the one at Prairie du Chien, except  
that there will be a small span at each end.  
It measures 400 feet in length, and will prob-  
ably cost about \$100,000 when completed.  
Mr. Lawler, its proprietor, says that it will  
be the finest pontoon bridge in the country.

The Mayor of Minneapolis has vetoed an  
ordinance which provided for lighting the  
city by electricity, because of the danger like-  
ly to arise from unprotected wire. If the  
wires were run underground, he said, his ob-  
jection would be withdrawn.

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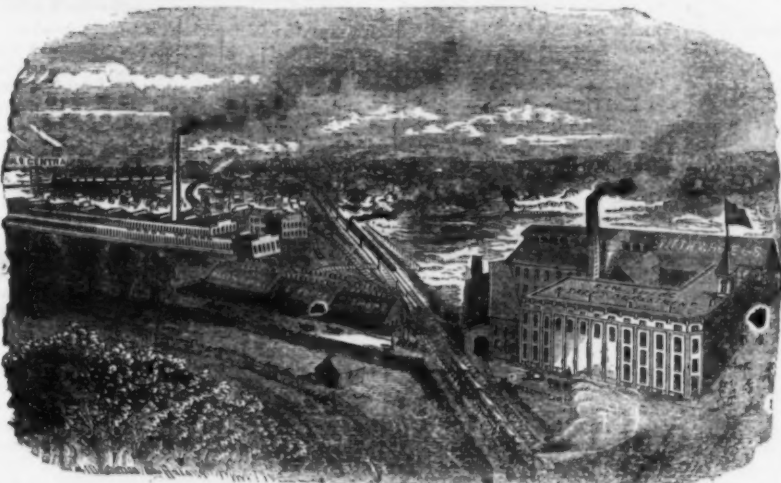
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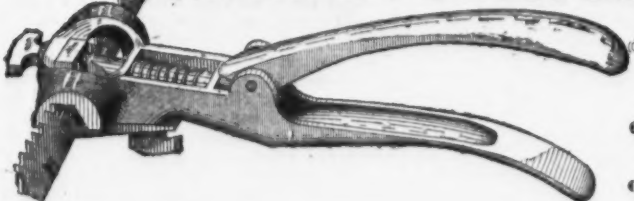
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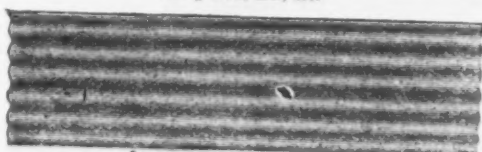
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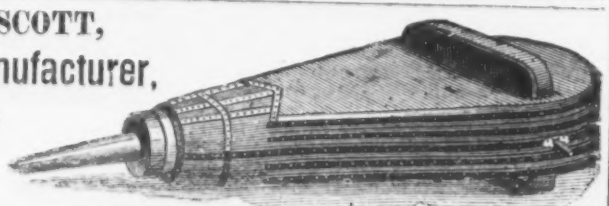
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Hook-Tooth,  
Knife,  
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Machine Mill,  
Mill,  
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Pillar,  
Pitsaw,  
Reaper,  
Roller,  
Round,  
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Flat Wood,  
Half-Round Shoe,  
Half-Round Wood,  
Horse, Plain and Tanged,  
Horse Mouth,  
Jig,  
Oval or French Shoe,  
Racer, Plain and Tanged.

## SPECIALTIES.

Butchers' Steels, Improved,  
Bent Riffles, Handled,  
File Cards,  
File Brushes,  
Machinists' Scrapers,  
Stub Files & Holder, Detachable.  
Surface File Holder,  
Vise File Holder.

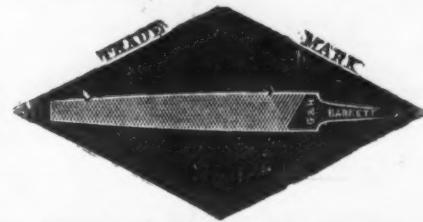
## NICHOLSON FILE CO.,

PROVIDENCE,

R. I.,

SOLE MANUFACTURERS.

## Black Diamond File Works.



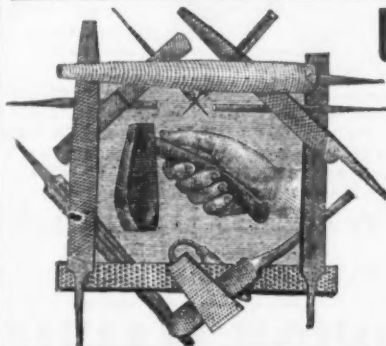
Awarded by Jurors of Centennial Exposition, 1876, for  
"VERY SUPERIOR GOODS."

**G. & H. BARNETT,**

39, 41 & 43 Richmond St., Philadelphia.

## CHARLES B. PAUL, Manufacturer of HAND CUT FILES.

Warranted CAST STEEL. 157 Tenth Street, Williamsburgh, New York.  
All descriptions of Files made to order. Price List mailed on application. Established 1863.



## UNION FILE WORKS,

311 to 315 North St.,  
BALTIMORE, MD.,

Manufacturers of

## FILES AND RASPS

Made from the Best Refined Cast Steel.  
With all the requisite facilities to produce a first-class article, we are enabled to offer Files that will give entire satisfaction.

**MORITZ & KEIDEL, Agents,**

48 & 50 German St., Baltimore, Md.

ESTABLISHED 1842.

INCORPORATED 1881.



CHAS. F. CRIPPS, President.

GILBERT PARKER, Treas. and Gen. Agent.

## THE J. BARTON SMITH CO.,

Manufacturers of the Celebrated

## J. B. SMITH'S FILES, RASPS, WOOD SAWS, &c.,

211, 215 & 217 New Street, PHILADELPHIA.

New York Branch, 128 Chambers Street.

WM. H. BRAMHALL, Manager.

Prices the lowest. Goods the best.

Send for sample order.

## DODGE & BLAKE.

DODGE'S PATENT

## FILE FORGING AND FILE GRINDING.

These machines have long been in use in this country and in Europe, and are unexcelled for perfection of work and labor saving. We now offer them with the latest improvements, and will apply them to forging and grinding other articles of tapering or otherwise irregular form.

Works at Woodside, NEWARK, N. J.

## THRIFT FILE WORKS,

Manufacturers of all kinds of

## Files, Rasps.



## FILES

JOHNSON & BRO.

No. 1 Commercial Street, Newark, N. J.

FILES! FILES!

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# A. FIELD & SONS,

TAUNTON, MASS.,

MANUFACTURERS OF

## AMERICAN AND FRENCH WIRE NAILS, TACKS, SHOE NAILS, And Every Variety of Small Nails.

Offices & Factories at Taunton, Mass.

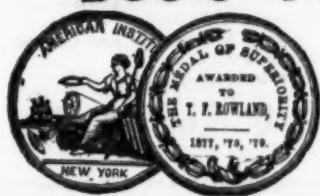
Warehouse at 78 Chambers St., New York,

where may be found a full assortment of Tacks, Brads, Wire Nails, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

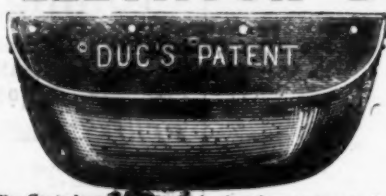
Any variations from the regular size or shape of the above-named goods made from sample to order.

A SILVER MEDAL has been awarded above goods at the Paris Exposition, being the only medal awarded any American manufacturer of Tacks and Wire Nails.

### DOC'S PREMIUM ELEVATOR BUCKET.



ALWAYS FIRST  
COMPETITIVE



PREMIUM IN  
TESTS.

This Bucket is struck out from the best charcoal iron; consequently is very durable. It requires 30 per cent. less power to run it than the old-fashioned square bucket, and will outwear half a dozen of them. Over 30,000 are now in use by the principal Millers, Brewers, Malsters and Manufacturers at home and abroad. It is the best Bucket made.

CAUTION.—The popularity of the DOC BUCKET has caused many manufacturers of the old style of Elevator Bucket to closely imitate its spherical shape. We warn all parties against patronizing infringers of our patents, as they will be held accountable. Send for circular. Address

T. F. ROWLAND, Sole Manufacturer, Continental Works, BROOKLYN, N. Y.

The Mill Bucket, in sizes from 3 1/4 to 16 inches.

## OLD COLONY RIVET CO., Kingston, Mass.

(Established 1866.)

### Manufacturers of NORWAY IRON RIVETS of Superior quality.

We carry a large stock of the various sizes of *Tinners', Carriage, Wagon, Hame, Belf, Barrel, Safe and Tank Rivets*, and make promptly to order all sizes not larger than 7-16 inch diameter. We have a capacity of two tons of the various sizes of small Rivets per day of ten hours. Freight allowed to all points on or east of the Mississippi River. Correspondence with buyers solicited.

WILLIAM H. DUNBAR, President. HENRY HOBART, Treasurer.  
JAMES L. HALL, General Agent and Manager.

We carry the most complete stock in the city with our New York agents, *The American Tack Co.*, 116 Chambers St.

### IRON-CLAD ICE BALANCE.

JOHN CHATILLON & SONS, NEW YORK,  
91 & 93 Cliff Street,  
Manufacturers of  
Spring Balances, Patent Balances, Union and  
Counter Scales, Spiral Springs.

Send for Illustrated Price List.

### ESTERBROOK'S

STANDARD  
and  
RELIABLE

## STEEL PENS

FOR SALE  
BY ALL STATIONERS.

ESTERBROOK STEEL PEN CO.  
Works, Camden, N. J. 2d John St., New York.

### THE ANSONIA CORRUGATED STOVE PLATFORM.

With Patented O. G. Border.

## ROUND ZINC.

27, 30, 32, 34, 36 inch.

Manufactured of heavy metal, requiring no nailing or lining, the edge retaining its form. Superior pattern, finish and quality. Price as low as any.

Send for List and Discount.

Packed 12 in each case.

Out Showing Round Platform.

## PURE ELECTRIC WIRE,

Manufactured by the

### ANSONIA BRASS AND COPPER COMPANY,

For Magnets, Telegraphs, Telephones, &c.

Insulated on the bare wire with H. Splittorf's patented Liquid Insulation, covered with cotton or silk.

All sizes of Bare and Covered Wire in Stock.

The conductivity of every bundle tested and warranted.

### THE ANSONIA WROUGHT GONGS,

For Clocks, Indicators, Telephones, Call Bells, Bell Punches, Steamboat and Railroad Use. Burnished or Nickel Plated.

ANSONIA BRASS AND COPPER CO., 19 Cliff St., New York.

# ESSEX

## HORSE NAILS.

Hot Forged, from Norway Iron, Warranted Best Quality, Pointed and Polished.

### HOWE & CO., Troy, N. Y., Sole Agents.

#### INDUSTRIAL ITEMS.

##### MAINE.

The new foundry and machine shop in Ellsworth is completed, and is now ready for business.

##### NEW HAMPSHIRE.

The Continental Construction Company, at Concord, are putting in \$2500 worth of machinery into the Old Prison Shop, which is the first installment of machinery for the manufacture of cars.

The Nashua Iron and Steel Company have forged a shaft for the steamer City of Berlin that measures 23 1/2 inches in diameter and 39 inches at the head. It is a creditable piece of work.

##### MASSACHUSETTS.

The new tack plate rolling mill of Reed Brothers, at Matfield, is now in successful operation. This mill, which covers an area of 7200 square feet, is located on a water-power near the Old Colony Railroad, and is fitted up with every appliance for the manufacture of tack plate. The machinery was entirely supplied by Pittsburgh, Pa., parties, and is very complete. The firm expect to put up additional puddling furnaces shortly and commence the manufacture of bar iron.

The Fall River Machine Company have delivered eighty-five cards to the King Philip Mill during the past two weeks.

At Fitchburg, we find D. M. Dillon's Boiler Works crowded with orders—enough to last until next August. He has just closed a contract for two straw boilers for the Ogi Paper Mill, of Japan. Singular as it appears, the Japanese come to Fitchburg for boilers. These boilers will weigh 21 tons when completed. Other orders for steel boilers have been received to make 2500 horse-power. Every boiler is to be equipped with two safety valves. Their safety valve is set at whatever pressure the owner desires, and then locked up, Mr. Dillon keeping the key in his possession, so that tampering with the valve is next to impossible.—*Boston Commercial Bulletin.*

At Springfield, R. F. Hawkins' iron works have built over 550 boilers of various kinds since 1879. The bridge and boiler departments are now full of work; 150 men are now employed altogether in the departments. The iron foundry to be erected for Messrs. Walker & Atwood, at Brocton, will be begun at once. It is to be conducted by a stock company, and the capital stock is already taken.

##### CONNECTICUT.

Bevin Brothers, Manufacturing Company, East Hampton, manufacturers of all kinds of small bells, having been in business since 1838, employ 50 to 75 hands, using an average of \$2000 worth of raw material monthly.

The contract for an iron bridge at Bardwell's Ferry, Mass., has been awarded to the Corrugated Metal Company, of East Berlin. It will be the largest single span bridge in New England, being 200 feet long.

A stock company has been formed at Meriden for the manufacture of Russian and Swiss chime sleigh-bells and saddlery hardware. E. A. Chapman moving his works from Middletown to Meriden.

The Crystal Knife Company, of Naugatuck, are forced to run their works day and night to fill orders for the new style of table cutlery.

The Yale Lock Mfg. Co., Stamford, who have for some years past been developing a line of patented jib, traveling, pillar and other cranes and hoists, have just completed a large machine shop for this department of their business. The company can fully employ the new shop on their present orders, which embrace two 20-ton power traveling cranes for foundry use; one 15 and one 10-ton power traveler for a machine shop, besides a number of hand and power machines of less capacities.

##### PENNSYLVANIA.

Isabella Furnace, in West Nantmeal Township, Chester County, which has chilled twice within a few months, was put in blast again on Sunday night last, and started off with fine prospects of success.

The plate mill of Boone & Co., Norristown, which has been idle for two weeks, was restarted last week. A sufficient number of orders for work have been received to warrant this step.

Work has begun on the new addition to the works of the Penn Hardware Co., in Reading. When this new department is completed, it will make room for forty more employees, thirty of whom will be molders.

Mr. B. H. Henderson bought the remaining three-fifths of the Allen Furnace, at Sharpsville, last week, at the rate of \$20,000 for the whole. As the property consists of the furnace and necessary machinery, in good repair, several tenant houses, flat cars, fine dwelling house, and fifteen acres of land, it would seem to be a very cheap property. It is expected to put the works into active operation soon.

The Neshannock Furnace, New Castle, made during week before last 741 tons of pig iron. This output from a country furnace, 60-foot stack, 16-foot bosh, running on mill iron, is pretty fair, and compares very favorably with some of the big runs made by the large furnaces here on Bessemer stock.

The rolling mill of the Duncannon Iron Company, at Duncannon, was entirely consumed by fire on the 13th inst. The mill consisted of four departments—the merchant, plate and rod puddle—all of which were running at their fullest capacity. About ten o'clock fire was discovered in the oil house which adjoins the merchant mill. The flames, fanned by a stiff breeze, burned with great rapidity. A fire engine was at once brought, but before it was put into use the flames had communicated to the other portions of the large building, and it was half on fire before anything could be done. It was then too late to save any of the works, and the attention of the employees was turned to the machinery and the adjoining property, and they succeeded in doing good work. The origin of the fire is not known, but supposed to have started from the explosion of the lamp of an employee in the oil house. The loss will amount to from \$50,000 to \$75,000, with an insurance of about \$20,000. Over 300 men were employed in this part of the works and they are thrown out.

The Philadelphia Steel Forge have opened a store at 232 Lake street, Chicago, and will

carry in stock a full line of fine grade tool steel, all sizes. Mr. C. J. Wickersham will be in charge of that department of their business.

Lovegrove & Co., 152 North Third street, Philadelphia, have recently taken an order from parties in New Mexico, amounting to \$60,000, which includes two boilers, compound Wellington steam pump, five miles of 6-inch wrought-iron pipe, wrought-iron tank, 200,000 gallons capacity, and other items.

The elevator recently erected by a Boston firm in the new Philadelphia Record building, Chestnut street, above Ninth, is not giving satisfaction, and is to be taken out. Mr. Singerly, publisher of the Record, after examining the merits of various elevators, decided to replace it with a Clem & Morse elevator of the Albee Hindley screw-gear pattern, with the Hewitson automatic safety clutch, which obviates danger from causes unprotected by any safety appliance.

Mildale Iron Company (formerly Little Schuylkill Rolling Mill) will be started up in a few days, Wm. L. McDowell and J. Barclay Hucker, lessees.

##### PITTSBURGH AND VICINITY.

The Lawson boiler-bursting experiment has not come off yet.

It is now expected by the M. & M. Bank, and the others associated with it, that the Pittsburgh Steel and Iron Company will only operate the old Anderson mill on Ross street. The new mill, in which the direct process is used, and also the wire mill on Second avenue, are to be purchased by the New York syndicate and operated by them in connection with Dr. Siemens. The New Yorkers will pay the bank some cash, and give security for the rest, and start up the new mill directly.

The Pittsburgh Locomotive Works Company in Allegheny, is building an addition to their works, which will cost at least \$50,000.

Messrs. Oliver Brothers & Phillips have purchased Bakewell & Co.'s tableware glass factory, at the corner of Ninth and Bingham streets, and contemplate using it as a factory. This, however, will depend pretty much on whether the McKinley bill passes Congress.

Graff, Bennett & Co.'s iron works, at Millvale, will again soon be under roof. The plate mill and both of the Universal roll departments, which are not altogether under cover, are now operated double turn. The puddling furnaces have not yet been relighted. The muck bar iron consumed at the machinery now in motion is manufactured at Graff & Bennett's works (formerly Reese, Graff & Woods). Every department was to be operated before this time, but the delay is caused in getting machinery. However, it is thought that in about two months every department will again be set in motion. A new train of 10-inch rolls will be added to the mill, which is being rebuilt from the Centennial building, and will be one of the finest industrial works in Western Pennsylvania.

Mr. Cline, president of the Window Glass Workers' Association, says that he never knew the window glass trade to be so brisk as it is at present. He says that the manufacturing capacity of the factories in the United States is about 2,000,000 boxes, while the demand this year will fully reach 3,000,000. A great deal of this will be exported. Mr. John Scott, of the Allegheny Valley Railroad, has sold out his entire interest in the firm of Carnegie Bros. & Co., Limited, to Andrew Carnegie.

Laufman & Co., of the Apollo Iron Works, have contracted for a new sheet mill. This will increase their capacity 450 tons per week.

The gas well now being bored for the New York City Plate Glass Co., at Hites Station, has reached the depth of 1205 feet. The company have contracted for four wells, of which this is the first. They expect to complete it by next week. The derrick for the second well is now being erected, and drilling will begin shortly.

Messrs. Jones & Laughlins, of the American Iron Works, inform us that the statement that they were building 25 new puddling furnaces has no foundation.

##### VIRGINIA.

The Ferrol Furnace property in Augusta County has been sold to Mr. Samuel E. Griscom, of the Pennsylvania Diamond Drill Company, of Philadelphia, who, it is stated, proposes to form a new company, to be known as the Augusta Iron Company. The property consists of about 6500 acres of land, with ore mines, storehouse, buildings, &c., and the furnace, which is a coke stack, 40 x 10, and has been making from 15 to 18 tons per day. It has been out of blast for some months, but is in good condition, and will be blown in at once. We understand the price paid was \$117,050.

##### OHIO.

The proposed glass works at East Liverpool has not yet taken any tangible shape, but it is said that work will be commenced as soon as the weather permits, and enough funds are secured to push on the work.


A stove company has been organized by Wooster capitalists, and has been incorporated with a capital stock of \$25,000. The foundry of Stevens & Co. has been leased for a number of years, and will be fitted up by the company for the manufacture of all kinds of stoves. They expect to have the establishment in full blast within the next two months.

The Tyler Hoe and Tool Works, at Ironton, were sold for \$3550 at auction last week, to John D. Jervis, H. B. Wilson, W. S. Kirker and George N. Gray. They have applied for a charter, and will incorporate under the name of the Ironton Hoe and Tool Works. Some new and improved machinery will be introduced, and the works put on a business footing as soon as possible. They intend at the start to manufacture hoes and picks, but will introduce other articles after awhile.

Everything is in readiness for commencing work upon the new nail works to be erected at Mingo. One hundred machines are to be put in, and it looks now as if Steubenville is shortly to become the great manufacturing center for nails and glass. Four glass works are in operation, and arrangements are being made to build another. This city has a bright future before her, and no better location can be found anywhere for manufacturing. The Board of Improvements is doing much for this city.—*Cleveland Herald.*

**Cutlery.**  
**THE LAMSON & GOODNOW MFG. CO.,**  
 Salesroom and Warehouse, 38 Chambers Street, New York City.  
 Factories, Shelburne Falls, Mass.  
 Superior Cutlery of all kinds and grades, from the finest in pearl and ivory handles to the lowest price in wood and iron handles.

**OUR BUTCHERS' and HUNTERS' KNIVES**  
 Are warranted to be equal in style, finish and quality, to any goods made in the world.  
**"COMPARE, THEN JUDGE."**  
 We are the sole owners of the *Gardner Patent Guard and Rest for Carving Forks*, and the manufacture of fine carvers is with us a specialty.

**AMERICAN MADE RAZORS**  
  
**J. R. TORREY, MANUFACTURER OF STROPS**  
**J. R. TORREY RAZOR CO., MANUFACTURERS OF RAZORS.**  
 In All Styles.  
 To introduce we offer **HOLLOW GROUND RAZORS** at \$1.00, \$1.75, \$2.00, \$2.50. Our **SWEDISH GEM RAZORS**, \$1.75, \$2.00, \$2.50, \$3.00. All our own make, and warranted the best cutters in the world. As razor makers we know what is needed to sharpen a dull razor, and will mail for 75 cents a strop warranted to set a fine edge to any razor. If in morocco case, \$1.  
 Factories at Worcester, Mass. Catalogues to the trade.

**JOHN WILSON'S CELEBRATED BUTCHERS' KNIVES, BUTCHERS' STEELS, AND SHOE KNIVES.**  
 TRADE MARK.  
 "FOUR PEPPERCORNS AND A DIAMOND."  
 GRANTED A D 1766 BY THE CORPORATION OF CUTLERS OF SHEFFIELD AND PROTECTED BY ACT OF PARLIAMENT.  
 REGISTERED ALSO AT WASHINGTON U.S.A. ACCORDING TO ACT OF CONGRESS.  
 ALSO AT LEIPZIG, IN ACCORDANCE WITH THE GERMAN TRADE MARKS' REGISTRATION ACT.

It having come to the knowledge of JOHN WILSON that Counterfeit Butchers' Knives, purporting to be of his manufacture, are being sold in the United States, he hereby cautions all purchasers of his Knives and Steels to be on the alert against such impostors.

JOHN WILSON also hereby gives Notice, that it is his determination to institute Legal Proceedings against any person or persons who may be detected infringing his Trade Mark.  
 Every article of JOHN WILSON'S manufacture, bears the Trade Mark, in addition to the Name.

WORKS:—SYCAMORE ST., SHEFFIELD, ENGLAND. Established 1750.

**Seymour's Diamond Edge Solid Cast Steel SHEEP SHEARS.**  
 Great Triumph of American Industry.

See issue of March 2 for full particulars.  
  
 Every Pair Warranted Superior to Imported. Price lists sent on application.  
**HENRY SEYMOUR CUTLERY CO.,** 84 & 86 Chambers Street, NEW YORK.

Manufactured of  
**IMPORTED ENGLISH CAST STEEL.**  
 Every Pair Warranted.  
 For samples and prices address,  
**GIFFORD MANUFACTURING CO.,**  
 OFFICE, 39 WORTH STREET, NEW YORK.  
 Factories, Union City, Ct.

Unriveted **SHEARS.** Solid Steel **SCISSORS.** Jagged and Nickled.  
**STAR TOOL CO.**  
 FLEXIBLE STEEL RULES and CENTER GAUGES Made of Best Quality Tempered Steel.  
 These Rules and Gauges are guaranteed of correct measurement, graduating 1/16, 1/32 and 1/64 inch. Price Lists upon application.  
**McCOY & SANDERS, Sole Agents,**  
 43 Chambers St., New York.  
 Office of

**PHOENIX CASTER CO.,**  
 Indianapolis, Ind.

Hibbard, Spencer & Co., Chicago, have sold our Casters as follows:  
 1879.....\$322.60  
 1880.....590.02  
 1881.....1371.26  
 Melson, Matter & Co., Grand Rapids, Mich.:  
 1879.....\$64.60  
 1880.....240.00  
 1881.....574.51  
 We have just issued a new Catalogue, which we would be pleased to mail with terms upon application.

**PHOENIX CASTER CO.,**  
 Manufacturers,  
 INDIANAPOLIS, IND.

  
 Our Pattern is so uniform, simple, and direct all competitors from the north.

**WROUGHT IRON ADJUSTABLE**  
 "Forty Daisy Trucks in use. Just what we want."  
 WASHINGTON STAMPING CO.,  
 Washington, Ohio.

**TUCKER & DORSEY, MANUFACTURERS, INDIANAPOLIS, IND.**

**THE "EDDY" STRAIGHTWAY VALVES.**  
 ALSO, FIRE HYDRANTS, Aps, Hatchet, Powder and Brush Machinery.  
**MOHAWK & HUDSON MFG. CO.,**  
 WATERFORD, N. Y.  
 BENTON, FAULKNER & BIRD, N. Y. Agents.  
 C. H. & W. H. MIDDLETON Phila. Agents.

Fires from Spontaneous Combustion May be prevented by using **MACHINERY WIPER CLOTHS.**  
 Instead of cotton waste for cleaning Machinery, &c. Don't wait until you have a fire before waking up to the importance of adopting our Wiper Cloths. For sale by the trade generally, or by the **BROWN MANUFACTURING CO.,** Providence, R. I.  
 These Towels are the best for all kinds of cleaning. Price to consumers, \$3 per 100. Special prices to the trade.

**ALFRED FIELD & CO., COMMISSION MERCHANTS,**  
 New York, Birmingham, Sheffield, Liverpool.  
**Guns and Pocket Cutlery, SPECIALTIES.**  
 Headquarters for  
 ELEY'S BROS.' GOODS, WRIGHT'S ANVILS, WILSON'S BUTCHER KNIVES, &c. WOSTENHOLM'S POCKET CUTLERY AND RAZORS. FIELD, FRASER & CONTINENTAL POCKET KNIVES. BUTCHER'S FILES, TOOLS AND RAZORS. JOSEPH ELLIOTT'S CELEBRATED RAZORS. WESTERN FILE CO.'S FILES. ENGLISH AND GERMAN GUNS. ROBERT SORBY & SONS' SHEEP SHEARS. STUBBS' FILES. WESTERN FILES. GREATER SHEEP SHEARS. CHESTERMAN'S TAPES. GERMAN COIL AND HALTERS and other CHAINS. BRADSHAW'S TROWELS AND HOES. CANASTOTA KNIFE CO.'S POCKET KNIVES. &c. &c. &c. &c.  
 All sorts of Hardware and Merchandise for import and export purchased on commission.

**Silver Medal, 1878—Paris.**  
  
**JOHN SPENCER & SON, Albion Steel Works, Sheffield, MANUFACTURERS OF FILES AND STEEL,**  
 Table Knives, Razors, Shovels, &c., &c., of every description.  
**CORPORATE MARK.**  
**JOHN SPENCER & SON, SHEFFIELD**  
 Granted 1749.

**FURNESS, BANNISTER & CO., NEWARK, N. J.**  
 Manufacturers of  
**TABLE CUTLERY.**  
 PRICES FURNISHED ON APPLICATION.  
  
**HILDEBRAND SELF-MEASURING PUMP AND TANK.**  
 Economical, saves all the oil, reduces insurance. The best arrangement extant. Can be used in barrel as readily as in tank. No measure or funnel used.  
**THE YOUNGSTOWN MEASURING PUMP CO.,**  
 Sole Manufacturers, YOUNGSTOWN, O.  
 Every Pump guaranteed to be just what we claim for it.  
 For further information address Company, as above.

**GEORGE W. BRUCE, 1 Platt St., New York, Proprietor of the Atlantic Screw Works,**  
 And Agent for the **Florence Tack Co.** and **C. A. Maynard**  
 Maynard's C. S. Planters' Hilling and Bog Hoes; Brad's Crown Planters' Hilling; Edwell's Weeding Planters' and Grub, and a variety of other kinds for Home and Export Trade.

**Cutlery.**  
**CORPORATE MARK.**  
  
**Joseph Rodgers & Sons' (LIMITED)**  
**CELEBRATED CUTLERY,**  
 No. 82 Chambers Street, New York.  
**F. & W. CLATWORTHY, Agents.**


The demand for Joseph Rodgers & Sons' productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam power.  
 To distinguish Articles of Joseph Rodgers & Sons' Manufacture, please to see that they bear their Corporate Mark

P. O. Box 3562.  
**ESTABLISHED 1836.**  
**Alfred Field & Co., COMMISSION MERCHANTS,**  
 New York, Birmingham, Sheffield, Liverpool.

**Guns and Pocket Cutlery, SPECIALTIES.**  
 Headquarters for  
 ELEY'S BROS.' GOODS, WRIGHT'S ANVILS, WILSON'S BUTCHER KNIVES, &c. WOSTENHOLM'S POCKET CUTLERY AND RAZORS. FIELD, FRASER & CONTINENTAL POCKET KNIVES. BUTCHER'S FILES, TOOLS AND RAZORS. JOSEPH ELLIOTT'S CELEBRATED RAZORS. WESTERN FILE CO.'S FILES. ENGLISH AND GERMAN GUNS. ROBERT SORBY & SONS' SHEEP SHEARS. STUBBS' FILES. WESTERN FILES. GREATER SHEEP SHEARS. CHESTERMAN'S TAPES. GERMAN COIL AND HALTERS and other CHAINS. BRADSHAW'S TROWELS AND HOES. CANASTOTA KNIFE CO.'S POCKET KNIVES. &c. &c. &c. &c.  
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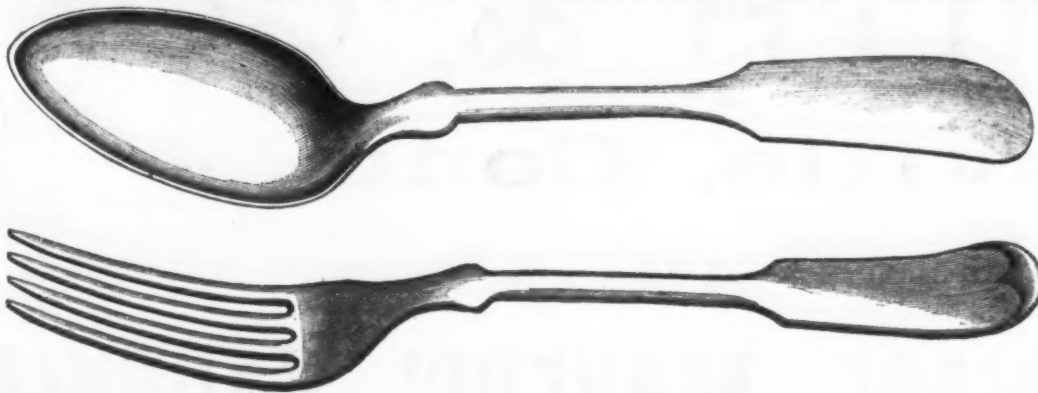
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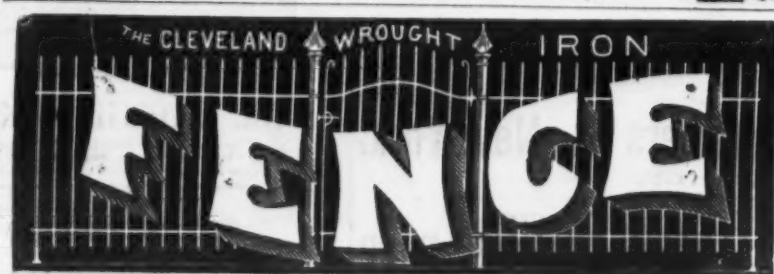
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has nearly all been removed to Hazelton.

The Baxter Brothers' stove works, of  
Salem, are offered Alliance on very reason-  
able terms, viz.: The grounds to build their  
works on and \$5000 cash. Dr. L. L. Lam-  
born has agreed to furnish the ground, and  
there is no doubt but that the money can be  
raised in short meter. Alliance has needed  
a stove manufactory very badly, and there  
is probably no better location for such a  
business in the State.—*Cleveland Herald.*

The Cincinnati Barbed Wire Fence Com-  
pany, a comparatively new concern, have in  
the past year gradually increased its produc-  
tion of barbed wire fence until its shipments  
have become very large. They have 14  
machines running constantly, producing  
per week 1,092,000 feet. The company  
have just shipped 12 carloads of wire fence  
to Texas and Kansas, and have some heavy  
orders on hand. They contemplate an early  
increase in the capacity of their works.

The Queen City Malleable Iron Company  
are making hatchets, chisels, shears and  
other edge tools of a very superior quality of  
iron, susceptible of forming a very perfect  
weld with steel with great facility, and  
making very handsome tools, having very  
much the appearance of solid steel goods.  
Their works are pushed to their utmost  
capacity, and with their present prospects of  
increased orders they will be compelled to  
make large additions to their present works.

Dispatches from Columbus state that the  
Capital City Car Works and the Timms  
Automatic Transfer Car Company have  
both made assignments to George E. Roberts.  
The concerns were identical, the former  
being an Ohio corporation and the latter an  
Indiana corporation, with headquarters  
at Indianapolis, S. Scott being the president  
of both companies. The capital claimed  
was \$100,000, and the works were completed  
last fall, and business begun then. They  
recently run behind on home debts, were  
sued, but gave personal security for the  
claims. A chattel mortgage for \$5881 was  
also filed a few days ago. The liabilities are  
reported to be large.

Lagrange has a very good prospect for a  
new rolling mill and nail factory. Messrs.  
David and C. H. Spaulding, who were so  
long at the head of the Jefferson Iron Works,  
are taking the preliminary steps toward the  
formation of a company with a capital of  
\$350,000 for the development of coal lands  
and building of a large rolling mill and nail  
factory at Brilliant, on the river and Cleve-  
land and Pittsburgh Railroad, seven miles  
below Steubenville. They have already there  
500 acres of coal land with a 5-foot vein of  
the same general character as the Steuben-  
ville coal, twenty acres of surface, and a  
shaft with all the facilities for hoisting, &c.,  
and supplying all the coal needed. We  
understand that this property will be put  
into the concern at \$75,000, and that the  
Messrs. Spaulding will make a cash sub-  
scription of \$100,000 additional, thus tak-  
ing half the entire stock. Opportunity  
will be given Steubenville parties to take  
stock in the enterprise, and any further in-  
formation on the subject may be obtained on  
application to C. H. Spaulding, Steubenville.  
The long experience of these gentlemen in  
the iron and nail business, no less the amount  
of capital they propose investing, is a good  
guaranty of the success of the project.

### VIRGINIA.

A new firm, under the title of the Southern  
Railway Supply Company, has recently been  
formed in Richmond. The managers of the  
concern are Mr. T. L. Courtney, Jr., who  
was for five years stock clerk with Smith &  
Rady, and Mr. George B. Gaines, who for  
some time held the position of traveler for  
the same firm. They will make a specialty  
of railroad, machinists', miners' and steam-  
boat supplies. Thomas G. Peyton is presi-  
dent of the company, George W. Archer,  
secretary, and George B. Gaines, treasurer.

### ILLINOIS.

The Gray Iron Company are adding a  
brass foundry to their works, and will man-  
ufacture brass and bronze castings of every  
description. They have also, after much  
experimenting, perfected a number of ma-  
chines for the manufacture of the Niles Pat-  
ent Lock.

R. Ellwood, manufacturer of steel barb  
fence wire, stretchers and shapers, Sycamore,  
has more than doubled his spring  
trade of 1881. He is now 600 dozen behind  
on orders, and is working day and night  
force.

The Thorn Wire Hedge Company are  
making several important additions to their  
works. They have just put in operation  
four new double-barb presses which cut and  
punch at the same time the steel barb out  
of the flat steel. They are also building  
new spoolers for spooling the wire. They  
will presently have running 18 additional  
barb-wire machines, besides 6 new Ross  
machines for four-point wire. There are  
now in use in this establishment 32 pony, or  
Briggs machines, 12 Peacock machines and  
8 twisters.

The situation at the Union Iron and Steel  
Company's works is still unchanged, the  
furnaces remaining blown out. At the pres-  
ent writing it is not known when work will  
be resumed.

### INDIANA.

Cobb's Iron and Nail Company, at Aurora,  
are doing some remarkable work in several  
of their departments at present. One day  
last week a single nailer turned out 25 kegs  
of rod, nails to the machine, while 14 is con-  
sidered a good average. Another nailer  
turned out 44 kegs of 6d. common nails on four  
machines in 12 hours of work. The usual  
average is about eight kegs to the machine.  
On Wednesday of last week 29 machines  
were running as follows: One on 3d., fine;  
one on 3d., common; six on 4d., common;  
eight on 6d., common; four on 10d., com-  
mon; two on 20d., common; five on 8d.,  
common; one on 2 1/2d., clinch, and one on  
2d., clinch. The product of the day was 426  
kegs of nails, or an average of over 14 1/2  
kegs to the machine, with only four machines  
on as large as 10d. and two on 20d. This

factory only has 33 machines, so that there  
were only four idle. With a full equipment  
of machines running, eight kegs to the  
machine is considered a good average. A  
good part of this success is attributed to the  
Haddock machines and O. P. Cobb's patent  
pile. By the use of the latter they are get-  
ting out 10 heats with the same amount of  
coal which they formerly used to get out  
seven heats. The iron from it is also softer,  
and the nailers do not have to grind the  
knives so often as formerly.—*Age of Steel.*

### ALABAMA.

The new Sloss Furnace, near Birmingham,  
will be blown in on April 3.

The Woodward Iron Co. are building a  
blast furnace ten miles southwest of Birming-  
ham. Stack, 17 x 75; three Whitwell stoves,  
18 x 70; two engines and blowing cylinders,  
48 x 84, built by Mackintosh, Hemphill & Co.,  
Pittsburgh. Stokes & Parish, of Philadel-  
phia, build the hoist. The officers and  
directors are: W. H. Woodward, presi-  
dent; J. H. Woodward (president La Belle  
Iron Works, Wheeling), secretary and treas-  
urer; J. N. Vance (president Riverside Iron  
Works, Wheeling), director.

### MISSOURI.

McDonald & Bro.'s Forge and Rolling Mill  
Company, of St. Louis, have recently erected  
a new train of 18-inch rolls, with a capacity  
to turn out railway axles of about 160 per  
day, and also three new upright double-act-  
ing steam hammers within the last twelve  
months. The company had been running  
full handed night and day until the recent  
floods occurred.

The Union Machine Shops, St. Louis, have  
been running full-handed night and day,  
and have turned out some valuable ma-  
chinery recently. The shops have recently  
been enlarged by the building of a 24 x 35-  
foot brick addition.

The Enterprise Architectural Iron Works  
and Foundry Company have built an addi-  
tion extending their pattern and machine  
shops; dimensions, 50 x 103 feet. The com-  
pany have also put in a new lathe for turn-  
ing columns, a new punching machine, three  
large drill presses and two new forges in its  
finishing department. To the pattern depart-  
ment a new circular saw, scroll saw and  
other machinery have been added.

The Great Western Glass Works Company  
employ 225 men and work two 11-pot fur-  
naces, each pot holding 2000 pounds of  
molten glass. The consumption of metal each  
week is 63 pots, or 126,000 pounds, and  
this metal is all manufactured into flint glass  
bottles.

### LABOR AND WAGES.

In accordance with a resolution passed at  
our last Amalgamated Association Con-  
vention, the nail plate rollers of the association  
will meet in the city of Wheeling on the first  
Friday in April to arrange their present  
scales. If all from outside places cannot  
attend, at least one from each nail mill should  
do so.—*Labor Tribune.*

The strike at Oliver Bros. & Phillips' mill,  
Pittsburgh, which occurred a day or two  
ago, is over, and the men are at work as  
usual. It appears that once in a while the  
scrap, which is gathered about the mill, is  
run in, which, of course, made more work  
for the rollers, although they did not receive  
any extra pay for it. It was when some of  
this was being worked up the strike occurred,  
the men demanding extra pay. The firm  
acceded to their request, and after the loss  
of three heats the work was commenced again.

A telegram from Frostburg, Md., says:  
As the result of a notice issued by the presi-  
dents of the twelve coal companies in the  
George's Creek and Cumberland regions that  
a reduction of 15 cents per ton would be  
made in wages, 3000 miners went on a  
strike. This strike, which is the largest  
ever known in this region, leaves two hun-  
dred and odd mines idle, and will doubtless  
cause George's Creek and Cumberland coal  
to disappear from the markets in a few days.  
The men were ordered to strike by the Exe-  
cutive Committee of the Knights of Labor.

The stove manufacturers of Troy have  
declined to accede to the demand for an in-  
crease of wages made by the Equalizing  
Committee of the Molders' Union, and it is  
feared a long strike will follow among the  
thousands of men employed in the stove  
foundries there.

The Omaha strike has utterly failed.

A circular has been issued from the Car-  
penter's Union, of Allegheny, Pa., to build-  
ing contractors and all firms employing jour-  
neymen carpenters, notifying them that car-  
penters receiving less than \$15 a week will  
expect an increase in wages to that amount,  
and those receiving \$15 and over, an addition  
of 10 per cent. The increase is to date from  
the 20th of this month. The carpenters  
maintain that they are the most poorly re-  
munerated of any workmen whose trade re-  
quires skill. The Allegheny contractors pay  
\$2, \$2.25 and \$2.50 per day, while their  
Pittsburgh brethren pay \$2.50, \$2.75 and \$3  
per day. The carpenters think that their  
demands will be complied with.

The troubles at Homestead, Pa., it appears,  
have been satisfactorily settled, the men  
agreeing to go to work as originally pro-  
posed, with one full turn of union men com-  
posed of a single set working full time.  
Secretary Martin said that it was further  
agreed that when any man on this turn  
should give up his job another union man  
was to be taken on in his place. The mill  
started Monday morning.

For several months past Oliver Bros. &  
Phillips have employed girls to nut bolts and  
tap nuts of the smaller sizes, such as are  
used in carriage building, and with great  
success. They now have sixty or seventy  
girls so employed, who give much better  
satisfaction than boys did. The girls earn  
from \$6 to \$9 per week. They work in a  
large room by themselves, even the "boss"  
being a lady. The firm have provided a dress-  
ing room, laboratories, and other conven-  
iences for their use, and they leave their  
place of occupation in the evening looking as  
clean and tidy as if starting on a shopping  
expedition.

The Amalgamated Association denies our  
assertion that the strike at Phoenixville, Pa.,  
is ended, and states that the men who went  
out are still out, and firm in their demands.  
We were aware that the men who went out  
are still out, and will probably stay out, but  
the strike is ended nevertheless.

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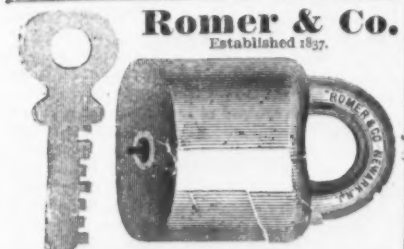
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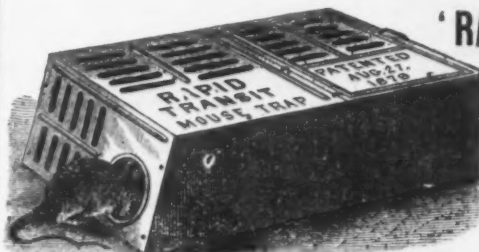
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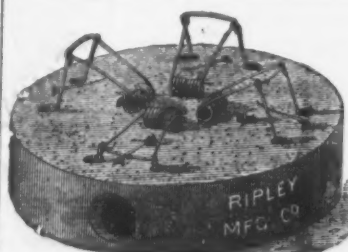
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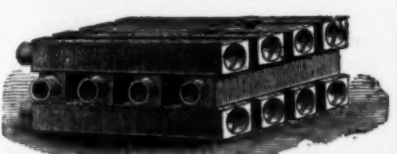
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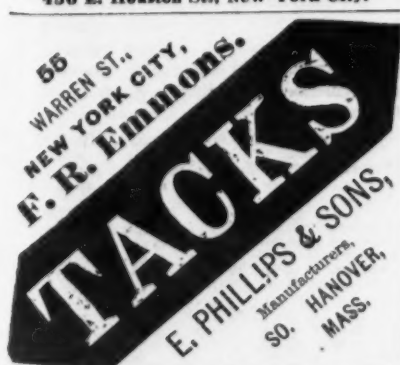


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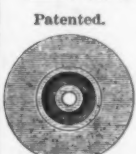
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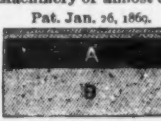
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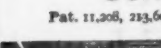
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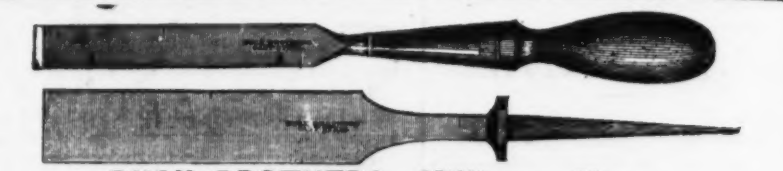
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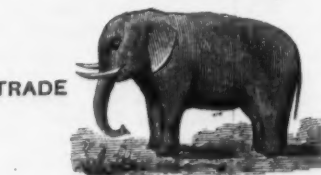
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Pump Rods,	Tubes,	Screws,	Jack Chains,
Rolled Bolts,	Nails,	Wire Cloth,	Sash Cords,
Sheets,	Boat Nails,	Pens,	Wire Ropes,
Plates,	Tacks,	Sash Chains,	Cast Kettles.

INGOTS FOR CASTING.

Send for Pamphlet and Price Lists.

### PHOSPHOR-BRONZE.

### The Conditions of Safety in Electric Lighting.

Mr. Edward Atkinson, who has recently  
been making an extended investigation into  
the subject of electric lighting and its dan-  
gers, has just made his report to the insur-  
ance companies of Boston, of which the  
following is an abstract of the essential  
points:

It having become apparent that insurance  
companies must probably accept methods of  
lighting factories by some kind of electric  
light as part of the risk to be covered by  
them, a complete investigation of the present  
condition of this art became necessary. In  
pursuance of this investigation the under-  
signed has visited several of the works in  
which electric lights are made, and has put  
a series of questions to all the companies,  
of which he has a record, from which this  
report is made. Between the two systems of  
electric lighting called arc and incandescent  
the underwriter must give the preference to  
the latter, which system may, we believe, be  
brought as near to absolute safety as any  
method of lighting can be, while the former,  
we believe, may be made as safe as gas or  
oil, probably safer, when carefully put up by  
responsible companies and kept under proper  
supervision or inspection. We may not at  
present venture beyond this judgment. The  
necessity must be seen by underwriters of  
keeping the mill yard entirely free from the  
danger of telegraph, telephone or other wires  
coming in contact with electric light wires  
belonging either to the corporation or used  
outside the yard in the general service of the  
public. This caution applies to the wire of  
the incandescent light as well as that of the  
arc light, because the larger quantity of the  
electricity carried upon the wire in the incan-  
descent system makes a diversion from a  
large to a small wire dangerous. By such  
an accident a small wire may be dangerously  
heated through a considerable distance. The  
danger of the arc lamp itself, unless pro-  
tected above and below, has already been  
stated, and is easily provided against. The  
dangers of contact with telegraph, telephone  
or electric watch-clock wires are too obvious  
and well known to call for further warning,  
and are readily guarded against in a well-  
organized mill yard.

#### ANOTHER DANGER.

There is another danger which may also  
be easily avoided, but which notice should be  
taken of at once by every one using the  
electric arc light—namely, it appears that if  
the wire conveying the current is suddenly  
fractured while the dynamo machine is in  
operation, the voltaic arc may be extended,  
while the ends of the wire are slowly separ-  
ating in still air through a considerable dis-  
tance, varying according to the power of the  
machine; that is to say, if the wire is broken  
at such a place that one end can fall or sepa-  
rate from the other, the arc, or what would  
be called in common speech the electric  
spark, may follow from one broken end to  
the other to a considerable distance, varying  
according to the current generated. If in  
that distance the current should pass through  
or come in contact with wood, or any com-  
bustible material, especially loose stock or  
fibrous material, fire would instantly occur.  
Such an arc might also, and probably would,  
be dangerous to life if a person were exposed  
to it. A fracture of the wire may be occa-  
sioned by the breaking of a belt, by the rup-  
ture of machinery, by a careless mechanic  
working in the neighborhood of the wire, and  
by many other causes. The greatest care  
should therefore be taken in choosing the  
position of the wires, and they should never  
be carried along the under side of the beams  
or the transverse thereto, nor in proximity  
to belts, shafting or pipes. The danger of  
suspended wires exposed to the action of  
machinery will be apparent.

#### METHOD OF PLACING WIRES.

We are not fully prepared to suggest the  
true method of placing wires and protecting  
them. It may be suggested, however, that  
the wires should be carried upon the walls  
out of reach of contact, and across the mill  
upon, or protected by, the beams, but insu-  
lated therefrom. In dye houses, bleacheries,  
print works, paper mills and other works  
where wet processes are in use the greatest  
care must be taken that two wires do not  
come in contact with the same surface of  
damp or wet wood, as in such a case a cross  
arc may be formed upon the wood, and it  
appears that if common salt is in the water,  
and perhaps other salts, the danger of a  
cross arc upon the wood is very much in-  
creased. Salt being used in whitewash, a  
damp surface of wood whitened may be most  
dangerous. By "cross arc" we mean the  
diversion of the electric current from one  
wire to another across damp or wet wood-  
work. It is suggested that this danger be  
wholly avoided by carrying the wire from  
the machine to the lamp over a separate  
beam or surface of wood from that on which  
the other wire is carried away from the  
lamp. There is little doubt, however, that  
all danger which may be caused by the di-  
version of an electric light current to tele-  
phones or telegraph instruments, can be ob-  
viated by applying to these instruments what  
is called in the Edison system of incandescent  
lighting a "safety catch," which consists of  
a small bit of lead so placed in the circuit  
that upon the diversion of a strong current  
to the wire, it will be instantly melted and  
the current broken. It may be added that we  
have not yet found any cause of danger of  
fire from the use of the electric method of  
lighting which may not be avoided, if the  
right method and proper care be used in put-  
ting up and operating the apparatus; but  
electricity is a force which cannot be too  
carefully controlled, directed and watched,  
if generated in currents of considerable  
intensity.

We herewith submit the regulations for  
the use of electric lighting apparatus which  
have been prepared by our inspectors, after  
a full study of the whole subject, which  
regulations are, in our judgment, sufficient  
to meet the case.

#### DYNAMO MACHINES.

Dynamo machines should be located in dry  
places, not exposed to flyings or easily com-  
bustible material, and insulated upon wood  
foundations. They must be provided with  
devices capable of controlling any changes  
in the quantity of the current, and if these

governors are not automatic, a competent  
person must be in attendance near the  
machine whenever it is in operation. Each  
machine should be used with complete wire  
circuit, and connection of wires with pipes,  
or the use of ground circuits in any other  
method is absolutely prohibited. The whole  
system should be kept insulated and tested  
every day for ground connections at ample  
time before lighting to remedy faults of insu-  
lation, if any are discovered. Preference is  
given for switches constructed with a lap-  
ping connection, so that no electric arc can  
be formed at the switch when it is changed;  
otherwise the stands of switches where pow-  
erful currents are used should be made of  
stoneware, glass, slate or some incombusti-  
ble substance which will withstand the heat  
of the arc when the switch is changed.

#### WIRES.

Any conducting wire which is warm to  
the touch, in comparison with another wire,  
is liable to become a source of danger, and  
should be replaced by a larger wire. Con-  
ducting wires should be secured to insulat-  
ing fastenings and covered by an insulation  
which is waterproof on the outside. When-  
ever wires pass through walls, roof, floors or  
partitions, or where there is a liability of  
abrasion or exposure to rats and mice, the  
insulation should be protected with lead,  
hard rubber, stoneware or some other satis-  
factory material. Joints in wires should be  
securely made and wrapped. Soldered joints  
are desirable, but not essential. Wires  
should not approach each other nearer than  
one foot, and twice that distance is prefer-  
able in conducting electricity of high ten-  
sion. Care should be taken that wires are  
not placed above each other in such a man-  
ner that water would be liable to make a  
cross connection. The chances of a broken  
wire should be everywhere provided against  
by securing the wires on suitable insulators,  
avoiding danger from an accumulation of  
lint by placing them one-eighth to one-quarter  
of an inch from the walls, ceilings or beams,  
except where necessary to lead to the lamps,  
and in all cases avoiding loops of wire or  
leading it across the space from beam to  
beam. A cut-out should be placed in the  
circuit outside of each building in a well  
protected and accessible place.

#### ARC LAMPS.

The lamp frames and other exposed parts  
of lamps should be insulated from the circuit.  
Each lamp should be provided with a sepa-  
rate hand-switch, and also with an automatic  
switch which will close the circuit and put  
the lamp out whenever the carbons do not  
approach each other or the resistance of the  
lamp becomes excessive from any cause.  
The light should be surrounded by a globe,  
and, when near combustible material, this  
globe should be protected by a wire netting.  
The globe should rest in a tight stand, so  
that no particles of melted copper or heated  
carbon can escape. Broken or cracked  
globes should be replaced immediately. Un-  
less the globe is very high and closes in as  
far as possible at the top, it should be covered  
by some protector reaching to a safe distance  
above the light. Flat sheets of metal or  
wire gauze should not be used for this pur-  
pose, because flyings will collect upon such  
places when the lamps are not in use. The  
lamps should be provided with some arrange-  
ment or device to prevent the lower carbons  
from falling out in case the clamp should not  
hold them securely.

#### INCANDESCENT LAMPS.

The small wires leading to each lamp from  
the main wires should be very perfectly insu-  
lated, and, if separated or broken, no at-  
tempt should be made to join them while the  
current is in the main wires. The conduct-  
ing wires leading to each building should be  
provided with a cut-out or its equivalent,  
capable of protecting the system from every  
injury from an excessive current of electri-  
city.

One subject may be touched upon, how-  
ever, says Mr. Atkinson, although its rela-  
tion to fire is very remote. It appears to be  
conclusively proved that at the end of a  
day's work the operatives in a mill who have  
worked some time by an electric light are  
more alert and in better physical condition  
than those who have worked by gaslight, the  
atmosphere being cooler and not being  
vitiated by the products of combustion.

Advices from Texas say that the Land  
Commissioner there has discovered a big  
scheme on the part of Wisconsin and Michi-  
gan lumber and mill men to acquire several  
million acres of pine land in Eastern Texas.  
They employed lawyers to have the lands  
surveyed and obtain information regarding  
them, and offered to purchase all the lands  
at \$1 per acre. Some of the lawyers en-  
gaged formed a smaller syndicate and offered  
\$1.50 per acre for part of the land. This  
exposed the plan of the Northern men, which  
was, as soon as they secured the land, to stop  
getting out lumber, or to gauge the amount  
in such a way as to advance the prices  
greatly, and realize immense profits. Both  
propositions were rejected by the Land Com-  
missioner, and Governor Roberts will recom-  
mend to the next Legislature that provision  
be made for selling to actual mill men the  
timber on the stump and reserve the land to  
the State.

The Railway Age says: "The pressure on  
locomotive shops for turning out work this  
year is greater than it ever before has been  
in our history. It will be months, at least,  
before the new locomotive works now build-  
ing a Rome, N. Y., and near Chicago, Ill.,  
will be ready to deliver engines upon orders,  
to say nothing of the prospect of works con-  
templated at St. Louis, Louisville and Youngs-  
town, Ohio. Meanwhile the old establish-  
ments are doing their best to facilitate the  
execution of their orders. Some of them are  
jobbing out the building of locomotive boilers  
to outside boiler manufacturers, which has-  
tens along the completion of the engines.  
One large boiler shop in Boston, we learn, is  
working to its full capacity on boilers for  
locomotives."

It has been proposed in Germany to dredge  
the Rhine, so that Cologne may become a  
seaport. The proposition has been received  
with much favor and with some apprehension  
upon the part of Hollanders and Nether-  
landers, through fear of serious injury to the  
ports of Antwerp and Rotterdam.

# The Iron Age

AND  
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A correspondent in Pennsylvania calls our attention to the fact that the text-books of political economy used in the schools and colleges nearly all inculcate the principle of free trade, and asks whether this cannot be counteracted by the introduction of an American book on the science of government, which shall explain the true principle of a protective tariff. "Such books," says our correspondent, "should be in the schools and colleges of the United States, and should treat of the powers, the objects and duty of the government, and the duty of citizens." The suggestion of our correspondent is not a new one, and the question has been asked many times, how the evils resulting from the teaching of free-trade principles in our schools and colleges can be counteracted. The production of a book adapted for use as a text-book would not do this, for at present it would be impossible to secure its introduction.

The remedy for the present unsatisfactory condition lies with the business men and citizens who are the patrons and trustees of our educational institutions, and until they are disposed to take an active interest in the matter, it is not at all probable that professors and presidents can be induced to change the present system, for they were brought up on the English text-books of political economy, and have no sympathy with the American idea. Being without experience in practical affairs of life, they do not understand the benefits of protection, and are too much prejudiced by early education to learn from statistics of our industrial development what, to the unbiased mind, they clearly show. It is to be regretted that our greatest political economist, Henry C. Cary, did not have a happier literary talent. No one was so well prepared as he to make a great and standard text-book of political economy for use in our colleges, but he seems to have lacked the talent which was needed to give his books popular interest.

## Strikes of Labor Against Labor.

The Pittsburgh Times, in a recent editorial regarding the strike at the Pittsburgh Bessemer Steel Works, enforces the importance of a phase of this and many other strikes that is too frequently, indeed almost universally, lost sight of. This strike is regarded and commented upon as a quarrel between the owners of the mill and the labor employed in the same. The truth is that it is a contest between workmen themselves. To quote the Times editorial:

It is not capital arrayed against labor; it is labor contending against labor. The Bessemer Company offered certain wages for the services of such men as were needed to carry on its operations. One party, known as non-unionists, agreed to the terms; the other, belonging to the Amalgamated Association, would not accede to them, and "struck." Because the former continued at work, the latter, left idle, grew angry, but their wrath manifested itself, not against the mill owners, but the non-striking operators. No hand was lifted against any owner or officer of the mill at any time. Only the men not of the union, who did not care to lose their labor and its wages and so continued on at their tasks, were made the victims of the violent revenge that followed. This same state of affairs exists still. The associated laborers ask to be restored. As a condition to this restoration they demand that men at work "who do not belong to their association" shall be dismissed to make place for those who do belong to the association—the issue all the while, be it noted, being one as between society labor and independent labor. Capital, except as a sort of arbiter, having nothing to do with the matter whatever. It is well that this fact should be kept carefully in mind. Only in this way can the situation be fully and fairly understood. The attempt when made, and by whomsoever made, to shift it and throw the responsibility on other shoulders, is gravely, outrageously wrong.

The case of the Times is still stronger when it is known that the question at issue was not one of wages really, but rather one involving the facility of striking. The company did at first demand that its employees should belong to no union, but it soon abandoned this position, and the strike was really over the question of giving three days' notice before leaving. The non-union men agreed to this and in the end the union men did also, and the issue at last was squarely one of union labor vs. non-union labor, in which the union labor demands that the manufacturer shall be its constable and enforce its edicts against those that do not choose to join the union ranks and be guided by the dicta of the Amalgamated. Strikes of labor against labor are much more frequent than are generally supposed. When a strike is announced the popular belief always is that it is one of labor against capital. Very frequently in the iron business the manufacturer has no part in it. It is about matters over which the manufacturer has no control. It is labor against labor. The recent long-continued strike of the cold feeders, at Wheeling, was not against the manufacturers, but against their fellow-workmen, the nailers. In nail mills, the nailer is paid so much per keg for cutting nails. Out of this he pays the feeder a certain proportion. The strike was for an increased proportion of what the nailers got per keg. The mills could not help themselves. They could not force the nailers to give a larger proportion, and so a large part of the mills were idle. Similar strikes take place about the rolls, the under hands striking against the rollers for a larger proportion of the wages paid per ton. It often happens that these "strikes" of labor against labor are the longest continued and most bitter of any that occur. It is the old story, that the hardest taskmasters of labor are those who have been laborers themselves.

In view of all these facts, we would suggest that it would be well to ask, when a strike is in progress and before the usual epithets of tyrannical, &c., are lavishly applied, whom the strike is against and whether the one that is entitled to sympathy is not the one against whom the strike is undertaken. It may be, it often is, true that the striker is the tyrant.

The spring meeting of the American Society of Mechanical Engineers will be held in Philadelphia, beginning Wednesday, April 10th. The details are not yet fully arranged, but we have no doubt the meeting will be both pleasant and profitable, and that the resident members of Philadelphia will do all in their power to give the visiting members a good reception. For mechanical engineers Philadelphia is a very interesting city, and the difficulty will not be to find interesting places to visit, but to choose between the many attractions, and to employ to best advantage the limited time which can be given to the examination of process and plant.

## Canals vs. Railroads.

The report of the Canal Auditor of New York presents some remarkable features regarding the movement of freights through the State by rail and canal, as will be evident on an inspection of the following statement showing the business of the canals and the New York Central and Erie Railways, and the aggregate movement for each year, commencing with 1876:

Year.	Tons moved by Canals.	Tons moved by N. Y. C. & E. R. R.	Tons moved by Erie R. R.	Aggregate tons moved.
1876 . . .	4,172,130	6,803,680	5,072,818	16,048,627
1877 . . .	4,955,963	6,351,366	6,182,431	17,489,770
1878 . . .	5,171,320	7,005,413	6,150,568	19,017,301
1879 . . .	5,364,372	9,015,753	8,212,641	22,592,766
1880 . . .	6,437,536	10,531,020	8,721,820	25,706,386
1881 . . .	5,179,192	11,591,370	11,086,821	27,857,383

The aggregate tonnage of the two railways amounted to 22,673,203 tons, being a gain over the previous year of 3,429,212 tons, or over 17 per cent. The combined tonnage of the canals and the railways was the highest aggregate yet reached, being a net gain of 2,150,808 tons over the previous year, and a gain of nearly 65 per cent. over the tonnage of 1876, when the aggregate was 16,948,627 tons.

The business of the canals, however, shows a loss in tolls of \$523,029, or over 45 per cent., and a loss in tonnage of 1,278,464 tons, or nearly 20 per cent. It will also be noted that the business of the Erie road increased nearly 2,250,000 tons, bringing it up almost equal to the Central, while the Central increased but about 1,000,000 tons.

Admitting the commercial importance of our water-ways, it looks as though railways were superseding the New York canals, and as though at no distant date these must follow the course of the old Pennsylvania Canal and the James River and Kanawha, and cease to exist as a transportation route for through freight. Railroads can and do carry almost as cheap as canals—as cheap, if time, delay, insurance, &c., are considered. One of the most marvelous changes in the past decade has been the cheapening of transportation over railroads. The report of the Pennsylvania Railroad just issued shows that the average rate received for transporting a ton of freight a mile was less than  $\frac{1}{4}$ ¢, while the cost was less than  $\frac{1}{8}$ ¢.

It is argued that the cause of this reduction is the existence of the Erie Canal, which is a conservator and forces low rates; but these low rates exist over the Baltimore and Ohio and Pennsylvania Railroads, the same as over the New York Central and the Erie, and there has been as great a reduction on the roads west of Chicago as on those east. The canal may have hastened the reduction, but it is not its cause. The causes are cheap steel rails and an immense amount of heavy traffic, improved motive power and the increase in the loading of cars made possible by steel rails, better track-bed and heavier motive power.

## Contract Labor in the State Prisons.

There is just now a very vigorous movement among the workmen to create a popular sentiment in favor of the abolition of the contract system in our State prisons. It is useless to argue the question whether the labor of citizens is diminished in value by the system of leasing the labor of convicts by contract, for the working classes have made up their minds that they are hurt by these contracts, and neither arguments nor facts would induce them to change their opinion. But there is one view of the case which they will do well to consider before they go any further. Either the convicts must be made to earn their own living by work, or they must be supported in idleness. It is simply impossible to induce the people of this State to accept the latter alternative. Experience having shown that our State prisons can be made self-sustaining, the farming classes and tax-payers generally will never again consent to be burdened with the cost of maintaining them. Now, if convicts are required to work it must be by one of two systems. They must either work for the State or for private individuals who will pay the State for their labor. Under the contract system the products of their labor compete as little with the products of citizen labor as possible. It is the interest of the contractor to get as much for his goods as he can, and to make as large a profit as possible, and so far as we know, the prices charged for prison-made articles are not lower than those demanded for articles of the same class made outside of prisons. In fact, the contractor cannot afford to sell them for any less, as his apparent advantage in the matter of cheap labor is more than offset by the disadvantage of having to take such men as are assigned to him, and to keep them at work 313 days in the year, whether he can sell his product or not. If the convicts were all skilled mechanics, his advantage would, undoubtedly, be very great; but few of them have either mechanical skill or the habit of industry, and to make their labor profitable, even at 50 or 60 cents per day, requires excellent management. Now, it would be easy, comparatively, to secure the abolition of the contract system and to make our prisons great State manufactories, but the advantage of such a change is very much more apparent than real. In that case the State would become a competitor with private enterprise, with practically unlimited capital and with no

fear of bankruptcy before the eyes of the prison officials. The goods thus made must be sold, and rather than keep them on hand they would be sold at whatever prices could be obtained. Such competition, we venture to say, would be infinitely worse than any ever experienced under the contract system.

## The Situation at Homestead.

The strike at Homestead has again been adjusted, and the mill resumed work on Monday morning, this time, it is to be hoped, without a misunderstanding that will again lay it idle. This strike in some of its features has been so important and may have such far-reaching effects, that it may not be out of place to review its cause, progress and results briefly.

Up to the first of the present year the mill of the Pittsburgh Bessemer Steel Company, Limited, had been run as a non-union mill under a contract. During the latter part of last year some of the employees joined the Amalgamated Association of Iron and Steel Workers and organized a lodge, and when the time came to renew the contract for the present year, refused to sign the same. Those refusing were by no means a majority of the workmen. Indeed, they were quite a minority. The chief features of the contract as first offered for signature were three days' notice of an intention to leave, not more than three to give notice at one time. Some two weeks after the strike, began a clause demanding non-membership in the union was inserted, at the desire of the non-strikers, as a measure of protection to themselves, but was afterward withdrawn at their request. There was also a question of wages involved, the company claiming that they paid more than other mills and demanding the same rates.

Up to the settlement of March 11 the struggle on the part of the union men was really for a formal recognition of their power as arbiters of wages, for the difference in the amount of wages involved was not a serious one, as the settlement finally made shows. Having signally failed by the use of the ordinary means to force compliance with their demands, a general meeting of the Amalgamated Association for the Pittsburgh district was called, at which the unusual, absurd action was taken of ordering a strike in all the mills in which the stockholders of the Bessemer Co. were interested. This proved a bad move. The lodge connected with Singer, Nimick & Co.'s works refused to strike, ostensibly on the ground that legal notice had not been given; really, it was known, because they would not be a party to any such action. In the meantime the officers of the company and the union got together and reached the agreement of March 11, which was as follows: "The question of reduction of wages is withdrawn by the Pittsburgh Bessemer Company, subject to an adjustment between the company and the union 'men within thirty days, the Bessemer Company to retain the men now in their employ, or, in other words, this question is to be left to the discretion of the company.' In place of signing the agreement individually, it may be signed by a committee of 'the lodge or lodges of the union belonging to the Amalgamated Association, or by 'President Jarrett, of that organization. 'This relates to what is known as the three 'days' notice agreement.' In other words, the union signed the agreement of union men, the non-union men for themselves, the rate of wages to be arranged by conference, the non-union men to be retained.

The mill, however, did not get to work, owing to a misunderstanding and a further claim of the union. The union claimed that it was to have a full turn, or one of the two turns. Mr. Clark, the manager, made out a list of those who would be taken back, making out the list from the strikers, all of whom he supposed were union men. It was discovered, however, that some were not, and, without notifying Mr. Clark, the mill was again stopped. The union men also wished to run the turn they were to have double, or work one set of men three days and another set three days, to give all the union men work. This was refused. Negotiations continued last week, which resulted in the selection of a full turn of union men, and a promise, on the part of the manager, that if any of the turn wished to be away for a turn, they could go and get men to fill their places, just what has always been the custom in this and most other mills. The result, it will be seen, is a compromise. The union is recognized; the contract is signed; the men who would not strike have kept their places, and the wages are to be adjusted on the basis of those paid in other mills. But there is a feature of this strike that is not done yet. The intimidation and outrages have been more marked than in connection with any other strike in the neighborhood of Pittsburgh for years. We have referred to this elsewhere. One striker has been sent to prison for a year, and others will get their deserts. It is folly to say that there has been no intimidation on the part of the strikers. The testimony given in a surety of the peace case on Saturday was that when men refused to join the strikers they were told they must take the consequences. This meant beatings, as Healy can testify; it meant shootings, as the Pittsburgh officers too well know.

Gen. W. T. Sherman and a number of engineers invaded Mexico on the 8th inst., by crossing the Rio Grande on the first train

of the Mexican Oriental Railway, over the new bridge at Laredo, Texas, and were received by the band of the 23d Mexican Infantry with, "See the Conquering Hero Comes." The affair was characteristically American, especially the band.

## The Labor Outlook.

The frequency of strikes and the generally disturbed condition of the labor market are among the most ominous signs of the times. We think the significance of these movements is not always correctly understood, and they have clearly been misinterpreted of late by the newspaper press. Instead of being an evidence of general and abundant prosperity, they indicate an effort on the part of the working classes to resist the necessary and inevitable shrinkage in the value of labor. This shrinkage is due to the fact that we are approaching a condition of over-activity in manufacturing, and that, should this condition be continued, we shall find ourselves suffering from what is called "over-production." During the past two years there has been a very great increase in the productive capacity. Every manufacturer has been crowded with orders, and has increased his plant as rapidly as new machinery could be obtained. Extensions have been built to works, larger premises taken to accommodate increased trade, and all the facilities of manufacturing have been adjusted to the basis of a continuance of the large demand of the past eighteen months.

There is nothing in the situation, so far as we can see, which menaces a crisis or a panic, but there is everything to warrant the belief that for a year or two competition for orders will be sharp and prices decline in consequence. In a good many trades the outlook is by no means as good as it was a year ago, and many manufacturers tell us that the orders now on their books could not be duplicated. In a word, the productive industries of the country are in a position to render it judicious to take in sail. Naturally, labor feels this contraction first. During the past two years wages have steadily advanced, until they are now higher than can be maintained, or than they are likely to average during the next three to five years. While the tendency of wages was steadily upward and advances were easily obtained, the unions were apparently content, but their officers probably knew enough to expect trouble in the near future, and, generally speaking, the treasuries of the unions are well supplied. The time is now coming when these resources will be needed for the maintenance of strikes. We cannot expect the workmen to look far enough to see that this money could be expended to much better advantage than in an attempt to resist the inevitable decline in wages. Their fund is accumulated for war purposes, and while it lasts they will steadily resist every effort to cut down wages. Of course, the unwillingness of labor to permit a peaceable readjustment of wages, on a basis of increased competition and lower prices, will have its effect in hastening the changes which are now looked forward to with so much apprehension. In some parts of the country building operations have already been checked by the unreasonable demands of carpenters, masons and others employed on building contracts, and instead of placing contracts, capitalists are waiting until they can be placed to better advantage. In a populous and desirable suburb of New York, where building operations have been extremely active for the past two years, few, if any, contracts have lately been placed, and if the disturbances in the labor market continue we may expect a dull summer, whereas a very little decline in wages would lead to the placing of contracts enough to keep every man in the building trades busy until the end of 1882. The following interesting comparison of the average earnings per week of mechanics engaged in the various departments of building is given in the Real Estate Record:

	January, 1880.	January, 1881.	January, 1882.
Bricklayers . . .	\$7.30	\$15.00	\$18.00
Carpenters . . .	27.00	30.00	35.00
Gas & steam fitters . . .	31.00	35.00	40.00
Hod carriers . . .	10.00	12.00	15.00
Stonecutters . . .	24.00	30.00	35.00
Do. polish'rs . . .	15.00	18.00	20.00
Do. rubbers . . .	21.00	25.00	30.00
Masons . . .	27.00	30.00	35.00
Painters . . .	21.00	25.00	30.00
Plasterers . . .	30.00	35.00	40.00
Plumbers . . .	18.00	20.00	25.00
Quarrymen . . .	15.00	18.00	20.00
Roofers . . .	24.00	30.00	35.00
Stairbuilders . . .	22.00	27.00	30.00

It is idle to moralize on the attitude of labor. The unions are strong, and they will use their strength to injure, so far as they can, the best interests of both labor and capital. When their power is broken, their treasuries emptied, and their membership scattered, they will have the satisfaction of knowing how much better it would have been had they considered their own interests more wisely.

The House Committee on Commerce, which has lately given so many railway authorities a hearing on the subject of the Regan bill, must have learned from the testimony offered that the problem of interstate transportation by rail is not one which can be solved by the simple expedient of "Be it enacted." We are not partisans of the railroads, nor in any respect zealous defenders of their interests. The public welfare always takes precedence of the welfare of a corporation, but it is by no means certain that the public welfare will not best be promoted by letting this problem of railway

transportation solve itself by natural processes, and by the result of competition between the various companies. Legislation designed to bind the railroads to arbitrary tariffs for transportation of freight and passengers would probably defeat the end sought. It would be absurd to suppose that any nine men, however selected, could safely be invested with arbitrary power to determine what the 1200 railroads of the United States should charge per ton per mile. Statistics show a steady and rapid decline in the cost of moving freights over our railroads, and the obstacle to the prosperity of the country which is claimed to exist in the great distances to be traversed by rail cannot be very serious, when wheat grown in the far West can be moved to the seaboard and exported profitably in competition with British and Continental wheat. We are by no means sure that Congress cannot profitably legislate on the question of interstate commerce, but it should approach this question with great caution, and with a due regard for the vast pecuniary and commercial interests involved. The House committee which has the Regan bill in charge might, with advantage, continue the inquiry all summer, for it will certainly be unable to report intelligently before the close of the present session.

The Post Office Appropriation Bill passed the United States Senate on Friday, minus the proposed amendment providing for ocean mail service by means of American-built steamers. Senator Davis, in the chair, decided that the amendment referred to was general legislation, not germane to the Post Office Appropriation Bill.

Referring to impending changes in the Canadian tariff, the Montreal Herald says the iron merchants complain loudly that they have not been as fairly treated as those in other lines of trade, who received ample notice and were enabled to keep their goods in hand.

#### WASHINGTON NOTES.

(From Our Own Correspondent.)

WASHINGTON, D. C., March 22, 1882.

The importers, having had things pretty much their own way in the matter of hoop iron and steel blooms, are now about to make a new departure in another article of iron manufacture. This time it is in axle forgings. The Secretary of the Treasury has already received preliminary information indicating that a request for a hearing will be made at an early day. The question at issue will be as to whether rolled or hammered iron, fashioned into the shape of forged axles, are axles. No date has yet been fixed for the hearing.

The orders consummating the change of duties on steel blooms of certain kinds have been sent to the Collector at New York, as follows: "On the 18th ult. you were directed to reclassify, at a duty of 45 per cent. ad valorem, certain steel railway blooms, imported by James Lee & Co., per State of Georgia, September 23, 1881, and Godeffroy & Co., per Pollux, October 25, 1881, and Amsterdam, October 13, 1881. The merchandise had been assessed by you with a duty of 2 1/2 cents per pound, under the provision in Schedule E, for steel in ingots, bars, &c."

That this ruling is regarded a permanent one is shown by the following further instructions: "You will govern your action in accordance with the views thus expressed, and in any pending appeals of like character now before you, the entries will be readjusted at the proper rate of duty, and the necessary steps taken for a refund of the excess of duties exacted."

In another case—that of steel angle bars—the specific duty is maintained. In reply to a recent communication from the Collector at Detroit, the Secretary of the Treasury states the following reasons: "The department is in receipt of your letter of the 30th of December last, transmitting the appeal (\$519) of the Detroit Dry Dock Company from your decision assessing duty at the rate of 2 1/2 cents per pound on certain 'steel angle bars,' imported into your port, under transportation bond from New York, on the 21st of December, 1881, which the appellant claims to be dutiable at the rate of 30 per cent. ad valorem. It is understood that the merchandise in question consists of flat bars of steel bent at an angle, thus, L, and costing under 7 cents per pound. In the opinion of the department, the fact that the bars are bent does not have the effect of removing the merchandise from the category of steel in bars, as specified in Schedule E (Hvyl, 1035). Your decision is therefore affirmed."

Petitions representing different parts of the country continue to be received urging the passage of the McKinley bill fixing the duties on iron and steel. Among the more recent may be mentioned that of the New Castle Iron Company, of New Castle, Del., of the workmen and manufacturers and citizens of Hamburg, Pottsville, Norristown, Minersville, Davington and Thordale in Pennsylvania, eight petitions of citizens of West Virginia, the petition of Thomas J. Edwards and other workmen in various counties, in Bibb County, Alabama, and the petition of citizens of the Fifth Congressional District in the State of Missouri.

The Tariff Commission scheme has received a boom in the revival of a recent petition of the American Chamber of Commerce, of New York. This organization is said to be composed of 700 representative manufacturers, agriculturists, mine owners, bankers, lawyers, merchants, importers, exporters and other citizens resident in all the States and Territories of the Union. They regard special legislation in relation to separate classes of imported goods as prejudicial to commerce, alarming to capital and detrimental to the growth of our manufacturing interests, and for that reason ask the designation of a commission to inquire into and report upon the present tariff laws and the alterations and amendments necessary to be

made for the promotion of national prosperity, and, further, that no special legislation changing the present tariff laws be adopted until after the report of the commission. This scheme of handling the tariff question, however, is about where it stood a week ago. In the House it has been subjected to divers delays, the Anti-Mormon and Chinese bills having been disposed of meanwhile. In the Senate on Wednesday, March 15, it was informally set aside, it being the unfinished business, Senator Garland having previously given notice that when the bill comes up again regularly for the consideration of the Senate he should offer as an amendment the bill that was reported by the committee adversely, which bill he had himself introduced; the next day the bill was again laid aside informally in order to proceed with the Post Office Appropriation Bill. So it has been continued from day to day. No one has indicated a desire to speak on the measure, and another week is likely to drag along without any decisive action. It is evidently the intention of the Senate to await the action of the House in the premises. The unfortunate turn which matters have taken give this measure anything but an encouraging outlook.

In the parlance of the lobby, the tariff movement during the past week has received a decided set-back. A free-trade Republican, who, under false pretenses, occupies a place in the Ways and Means Committee, finding his sinister aims not faring well, resolved on a flank movement, and under guise of considering the new rules, secured assent to a call for a Republican caucus. In the committee it had been practically decided to report a bill making material reductions in the internal taxes, especially in repealing the nuisance of the check and proprietary stamps. It also provided for a reduction of the whisky tax to 50 cents a gallon; malt liquors to 60 cents a barrel; tobacco from 15 to 10 cents; cigars from \$6 to \$4 a thousand. It was estimated that this would make a reduction of from \$50,000,000 to \$60,000,000 during the next fiscal year. Though the revenues are regarded as exceeding the absolute necessities of the Government by fully \$100,000,000, the sub-committee had concluded that the above amount would be within safe limits, as too sudden and great a reduction might be attended by unfavorable effects upon the financial system. The sub-committee were ready to make a formal report to the general committee, and there was no doubt of the bill being submitted to the House for its favorable consideration and early action. When Chairman Robeson called the caucus of Republicans to consider the new rules, everyone supposed that this knotty question was to receive further discussion. It has since turned out that Mr. Dummell, of Minnesota, who has been masquerading as a protectionist, and two or three others who have been playing the same role, were at the bottom of the whole movement, and had persuaded the chairman that the ostensible purpose of the call was necessary to the interests of the party. Mr. Dummell, it will be remembered, was one of the baker's dozen of Republican candidates for Speaker, and announced himself as such on the ground of his earnest advocacy of protection to American manufactures and labor. It will be further remembered that he received the stupendous support of four votes.

When the caucus met, Representative Shollenberger, of the Beaver Valley District, one of the most important iron manufacturing centers in Pennsylvania, and who is an earnest and sincere advocate of protection, introduced a resolution to the effect that any reduction in the internal taxes of the country would be inexpedient at this time. Representative Bayne, of the Allegheny City District, greatly to the surprise of the protectionists, earnestly supported the resolution. Several others followed in the same strain, when Representative Dummell took the floor and exposed the whole scheme. He stated that he favored no reduction in the internal taxes, as such a step would be more likely to secure a reduction in the customs duties, and that he favored this because it was his duty to his constituents. He furthermore stated that, during his last campaign, he announced himself as a free-trader, and that he would use all his influence to further that interest, and that if he had not taken this course he would undoubtedly have been defeated. This statement, it may be imagined, caused some excitement, for until then Dummell had been recognized as a protectionist on his own showing. The proposition received a majority of the caucus, many Republicans unthinkingly voting for it. This action of the caucus was not only a direct blow at the Committee on Ways and Means, but made it appear ridiculous. Judge Kelley, its chairman, said that, while he favored a reduction in the excise, he believed in obeying the action of the caucus, and, unless its orders were reversed, he would abandon the bill pending in committee. He said that the Republican party was committed to a reduction of taxes in some way, and if it did not come off excise it would do something else. Russell Errett, who represents the Pittsburgh District, is highly incensed at this action of the caucus, as giving away a most favorable opportunity of relieving the people of taxation, and of protecting the manufacturing interests and workmen of the country. Representatives McKinley and Townsend, of Ohio, support this view of the matter, and a few Democrats like Hewitt are also indignant. To complicate matters, the whiskey, malt liquor and tobacco interests threaten to combine against the tariff men, and antagonize any measure to fix the duties on iron and steel. Judge Kelley, however, perceiving the tendency of opinions in the House, says that he will favor a slow movement in matters relating to internal taxes and customs until public sentiment is expressed. Many influential members of the House say that the action of the few Republicans in misleading the party on this important question, will have the effect of defeating legislation on any tariff matters, and will, in all probability, embarrass the Commission project on the final issue.

In the Senate the Tariff Commission Bill has had quite a boom during the past week. Senator Pendleton made an elaborate speech in favor of the committee of Congress immediately preparing a tariff bill. He took the ground that the real difficulty in the

tariff was the number of details to be adjusted. The articles imported are so numerous, their classification so difficult and their uses so varied, that the proper relation of duty on raw material and on the manufactured article, the gradations of amount when duties are levied on an ad valorem or specific basis, and the point where revenue fails and exclusion begins, make up the real difficulty of the tariff. He was, therefore, opposed to a commission, adding: "If I had the power I would vote to instruct the Committee on Ways and Means of the House to report a bill. I am sure we have members of the Committee on Finance in the Senate who could perfect it as well as any experts in the country whom we are likely to get." Senator Morrill then spoke at length in favor of the commission, assuming that the President would appoint fit persons, and if not, they would be rejected by the Senate. Senator Beck, from Kentucky, next took a turn in a characteristic speech. He made the statement that a workingman in Windsor, opposite Detroit, could live at one-half the expense of the same man in Detroit. This led to a cross-fire which considerably enlightened the Kentucky Senator. Sherman wanted to know why, if what Beck said was true, Windsor was such an insignificant town. This, the Senator again dodged by insisting upon coming back to the facts. The Ohio Senator then gave the Kentuckian another plumper by inquiring, if living was so cheap in Windsor, why all the people of Detroit did not go over there to live. To this Beck was forced to reply: "Why, sir, the tariff cannot destroy this country," the contrary of which he had just been endeavoring to prove. At this juncture Senator Garland, who sits near by the Senator from Kentucky, came to his relief by asking permission to move to adjourn, to which Mr. Beck assented. Before the question was put, Frye, of Maine, desired to know how it was that a few years ago 300 French Canadians settled in his town, accumulated property in five or six years, and then returned to Canada. Mr. Beck made no reply to this, and the Senate adjourned. Having rallied from his discomfiture on Saturday last, the Senator from Kentucky again entered the lists on Monday, and sallied forth into a wandering argument, which elicited from several Senators an interrogatory as to which side he was on, to which he replied: "To a system that most closely confines the tariff to revenue."

In the House the Tariff Commission Bill met with a decided success, on a resolution of Judge Kelley, chairman of the Committee on Ways and Means, to make the bill to provide for a commission to investigate, the special order when the House next resolved itself into Committee of the Whole on the state of the Union, and so continue as the special order until disposed of. Springer, Cox, Blackburn and other free-traders, endeavored by supercilious objections to throw obstacles in the way. Chairman Kelley assented to a modification of the resolution, adding to it "not to antagonize the general appropriation bills." The resolution was adopted by a vote of yeas, 154, nays, 56, under suspension of the rules. The Tariff Commission Bill may be said to be fairly launched.

Consul-General Stanton, of St. Petersburg, has forwarded to the Department of State an interesting resume of the mining and metallurgical industries of Russia in 1879, (the latest report), taken from the report of Mr. Shalkofski, sub-director of the Department of Mines. This shows that while Russia's mining industries are constantly increasing, they are still far from meeting the home demand. The following table shows the production in pounds, (one pound being equal to 36 1/4 pounds avoirdupois):

RUSSIA'S PRODUCTION OF METALS AND MINERALS.

Articles.	1878.	1879.
Gold, pounds.....	3,572	2,631
Platina, pounds.....	126	136
Silver, pounds.....	609	637
Lead, pounds.....	85,882	82,842
Copper, pounds.....	214,846	192,688
Zinc, pounds.....	293,398	273,588
Iron ore, pounds.....	25,471,510	26,412,806
Iron, pounds.....	16,668,717	17,100,842
Steel, pounds.....	5,801,754	12,023,170
Coal, pounds.....	154,914,308	175,238,011
Naphtha, pounds.....	15,324,167	21,475,059
Cast iron, pounds.....	3,247,661	3,401,421
Chromite, pounds.....	355,167	642,115
Cooking salt, pounds.....	47,678,528	40,920,889
Metal coin-d, roubles.....	48,740,853	49,040,825
Laborers in mines, for mills, &c., number.....	281,959	292,046
Laborers killed and injured.....	425	611

In iron ore, steel and coal there has been a large increase. Steel has made special progress in St. Petersburg, Poland and the Ural districts, owing to the Government's demand for steel rails and the allotment of premiums, yet the production of iron and steel barely suffices for one-half the demand. The production of coal in Poland has quadrupled in ten years. Coal, pig iron, iron, steel, copper are the most important products of the mining and metallurgical industries which are imported across the European frontier, and the following table shows the amount and origin of these imports:

From	Coal.	Pig Iron.	Iron.	Steel and Steel Rails.	Copper.
Great Britain.....	70,558,099	6,956,248	2,073,189	2,068,114	315,075
Germany.....	1,924,174	1,023,172	1,023,172	1,023,172	1,023,172
Austria.....	1,023,172	1,023,172	1,023,172	1,023,172	1,023,172
France.....	1,023,172	1,023,172	1,023,172	1,023,172	1,023,172
Turkey.....	62,439	15,590	55,791	8,073	81,460
Russia.....	15,590	990,772	2,028,214	1,040,088	5,777,408
Poland.....	2,068	154,533	182,248	110,104	1,650,000
Italy.....		2,350			
Norway and Sweden.....					
United States.....					
Belgium.....					
Denmark.....					
Spain.....					
Portugal.....					
Switzerland.....					
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## Excelsior Lawn Mowers

Received Highest Award at the Centennial Exposition.

Features for the Season  
of 1882.

Lightest in Weight.  
Lightest in Draft.  
Simplest in Construction.  
Most Durable.  
And the BEST.




## OUR HORSE MOWER

USED ON PRINCIPAL PARKS OF EUROPE AND AMERICA.  
In Competition with other Mowers has always carried off the Prize.  
Hand Mowers 8 to 20 Inch.

IS CONCEDED BY ALL TO BE  
**THE BEST ONE MADE.**  
SIZES 25 TO 40 INCH.

All our Mowers are fully Warranted. A trial is Solicited.

Full Directions for Setting-up, Adjusting and using accompany each Mower.  
For Catalogues and Prices, address  
**CHADBORN & COLDWELL MANUF'G CO.,**  
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Capacity 1000 dozen per day.

GOODS WARRANTED TO GIVE SATISFACTION.




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WITH PATENT ADJUSTABLE ATTACHMENT. The only Saw that can be adjusted for either a One-Man or a Two-Man Saw. We make the following lengths, 3½, 4, 4½, 5 feet. Send for sample.

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**Hand, Panel, and Rip Saws,**  
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BRASS CASTINGS, CAR BEARINGS and SOLDER

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Pig Brass, Bar Tin and Lead, and Spelter.

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### HOLLOW BACK CROSS CUTS.

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### ONE-MAN SAW.

With Reversible Handle.



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It is self-locking and perfectly secure. It is made of brass and finished by our patented process. The above cut represents the only size yet made, but other sizes will be furnished as soon as the requirements of the trade are known.

For Sale by Hardware Jobbers Throughout the Country.

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Successors to Milo Peck, Manufacturers of



**PECK'S DROP LIFTER** is the only one which has its parts cushioned. Being thus cushioned they are the most durable Lifter in the market.

Can be attached to any drop now in use.

Send for Illustrated Catalogue.

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Improved  
Carpenters'  
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WAREHOUSES,

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General Agents for the sale of **Leonard Bailey & Co.'s "Victor Planes."**  
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THE MOST POPULAR AND ECONOMICAL HORSE SHOE IN THE WORLD!

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SOLE MANUFACTURERS,

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These shoes may be ordered in single or assorted sizes from the leading Hardware houses East or West. Among whom are:

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Dunning Sizes.....4, 6, 8, 10.  
Correspond with Iron Shoe, 2, 3, 4, 5.



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PECK & GODDARD,

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FOR ALL STATES EAST OF OHIO.

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These shoes are forged from a solid bar of steel. Afford a natural, even bearing for the foot. They will cure corns and improve tender feet. Being a finished shoe it only requires the work of shaping and nailing on. Send for sample keg (100 lbs.) assorted sizes. Illustrated catalogue sent on application.

The Only Perfect Horse Shoe Ever Put on the Market.

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MANUFACTURERS OF

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**HARDWARE AND NOTIONS.**

The Family and Triumph Egg Beaters,  
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The Turner and Seymour Mfg. Co. have been longer in the business and make a greater variety of Cast Iron Scissors and Shears than any other concern in the world. Our  
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We are now making a fine line of cheap  
Nickel Plated Scissors and Shears, Nut Picks, Nut  
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Price Lists furnished on application.



Prouty's Patent  
**PEERLESS FORCE  
PUMP.**

Has Self-Adjustable Foot Rest.

NEW AUTOMATIC COMPENSATING  
PACKING.

It will throw a continuous jet FROM  
FORTY TO SIXTY FEET. A new pattern  
jet and spray nozzle is sent with  
each pump.

Especially attention is called to the  
material and workmanship exhibited  
in these pumps.

LIST PRICE, \$8.

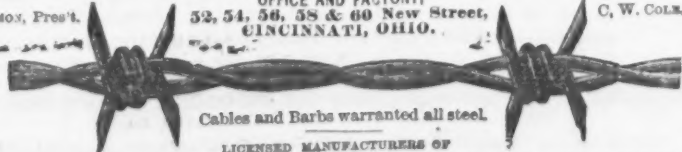
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C. W. COLE, Sec'y.



FOUR-POINTED BARBED WIRE FENCING.

We have large stock of Galvanized, Red and Brown Painted Barbed Wire on hand, and can fill all orders promptly. Send for sample and prices.

## NEW IMPROVED UPRIGHT DRILL

FOR  
BLACKSMITHS AND MACHINISTS,



THIMBLE SKEINS, BLACKSMITHS' TOOLS, JACK SCREWS,

SAD IRONS, COPYING PRESSES AND STANDS, &c.

MANUFACTURED BY  
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**BUFFALO SCALE CO.,**  
BUFFALO, N. Y.,  
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R. R. Track Scales, Hay Scales, Coal  
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Send for price list, stating what you want

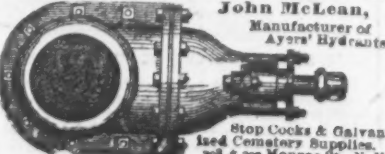
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**Scott's Peach-Pitting Machine.**

**GEO. M. EDDY & CO.,**  
Manufacturers of

**Measuring Tapes**  
Of Cotton, Linen & Steel.  
ALL PURPOSES.

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## A New Ironstone Field in England.

The probable duration of English iron ores has, within late years, proved an interesting theme for speculations and discussions, which are, perhaps, superfluous when we consider the fact that new and unexpected ore deposits are met with from time to time yielding sufficient material to meet the existing demands for years, lasting longer, in fact, than the coal deposits necessary for the smelting operations. The latest discovery is a vast area of ironstone on the estate of the Duke of Marlborough. The oolites and the lias on which it rests have an uninterrupted range through Gloucestershire, Oxfordshire, Northamptonshire, Rutlandshire and thence into Yorkshire, and in all of these counties, it now appears, there are vast deposits of ironstone. In Oxfordshire the lower oolites consist of forest marble, corabash limestone, slate and clay. The ores of the oolites were first brought into notice by the discovery in Cleveland, little more than thirty years ago, and have been the means of forming one of the largest and most flourishing towns in the North of England. Some twenty-three years ago operations were commenced at this point, resulting in the erection of a couple of blast furnaces for the smelting of the ores. Northamptonshire is now second only to Cleveland as regards the tonnage of ore raised. A large field of ore has been found in Rutlandshire, and will, probably, soon be worked, the Midland Railway having commenced establishing communication with it. Oxfordshire should finally be noted as the latest addition to the few counties in which the ores of the oolites are found. The clay ironstone of the liassic system are, therefore, the most important in the kingdom. Of course, they are not to be compared with the hematites of Cumberland or Lancashire, so far as quality is concerned, but that is more than made up for by their vast extent and thickness, and these are qualities that are now considered of more importance than they have hitherto been, because these ores are well adapted for the direct process by which Bessemer steel is produced. The new workings in Oxfordshire are situated in the Great Western line of railway, so that there is direct communication on one side with Staffordshire and with South Wales on the other. A large quantity of ore is sent from Northamptonshire to South Wales, but as the Oxfordshire field is more advantageously situated there is no reason why it should not participate in the trade. It is said that the Oxfordshire stone contains a considerable quantity of lime, and this may be an advantage more than otherwise, everything of course depending on the actual amount. If there is more than is required for fluxing—as is the case in that worked at Frodingham in Lincolnshire—it will have to be manipulated with great care. At Frodingham the excess of lime was found to be a most serious matter, and those who commenced the smelting found it a costly process, and one that did not pay. But by experience, it was afterward found that by a careful selection of the stone, the iron was all that could be desired, so that there is really no difficulty which cannot be got over. In Oxfordshire the stone is no less than 15 feet in thickness, and this should give something like 15,000 to 20,000 tons to the acre, so that an ordinary royalty is likely to lead to a good annual income, and there should be no difficulty in disposing of a large acreage yearly. The stone is already being sent into Staffordshire, where it is mixed with the local ore, producing a metal that is suitable for either mill or foundry purposes. There are also other districts that should be made available, seeing that, as a rule, ironmasters in coal districts prefer the stone of the oolites to that found in connection with the coal measures, which is of no great thickness and does not give such a large percentage of metallic iron, while it also costs a great deal more in raising. Furnaces are about to be erected close to the field already opened on the property of the Duke of Marlborough, and these are to be constructed with all recent improvements. The furnaces and the smelting of the iron promise to be attended by several new and important features that will attract the attention of all English ironmasters, especially those in the North of England, who have hitherto made most of the improvements that have taken place in the smelting of ores similar to those that have been met with in Oxfordshire. If there is any drawback to the most complete success of the works, it must be as regards the finding of the best description of fuel. But that after all is perhaps only a minor matter. In South Yorkshire a large tonnage of coke of excellent quality is now being made for iron smelting, and it only takes about 25 cwt. of it to produce a ton of iron, and this could be easily sent over the Midland, and then put on to the Great Western at either Birmingham or Worcester. The new district will be the nearest place to London where iron is made, and that should be an advantage, while it is also in direct communication with South Staffordshire, which now takes a large quantity of pig from Derbyshire.

the country. It is no small honor to have turned out, in a comparatively few years, 200 graduates who are fitted to take their place among the world's useful workers.

## Japanese Industries.

The British Consul at Hiogo and Osaka, Japan, states in his report on the trades at these ports during 1880, that though the foreign trade continued to increase, the year was a decidedly unprofitable one as far as imports were concerned. The deliveries of iron showed an increase of one-half, notwithstanding which the business was not satisfactory, as prices did not recover from the serious fall experienced at the beginning of the year. The Government works at Shinden were actively employed during the year on steamers and sailing vessels, and it has been decided to start composite and iron shipbuilding. In the engineering department eight pairs of new engines were made, comprising high-pressure, common jet-condensing, surface-condensing, and the newest style of high and low pressure surface condensing engines, with a total aggregate of 300 nominal horse-power. Eleven engines were repaired. Fourteen new marine high-pressure boilers were made and four repaired. During the year several large machines were added, including a long stroke planer, a large lathe, a hydraulic riveting machine, a new steam hammer, and a scrap iron furnace. Castings of all kinds, of brass or iron, from 6 to 7 tons weight, can be made, and all kinds of copper-smiths' work, including copper pipes of any diameter, are undertaken. The average number of men employed per day was 232, comprising pattern makers, molders, turners, fitters, boiler makers, blacksmiths and coppersmiths. The coke required is made on the premises from Japan coal. The Kobe Iron Works, owned by E. C. Kirby & Co., a British firm, were also busily engaged throughout the year. Nine steamers, with engines, boilers, &c., complete, were built, and repairs to a number of large vessels carried out, besides which there were made several land boilers, a quantity of mining machinery, and part of the machinery of a cotton mill of 3000 spindles at Osaka. The Kobe Iron Works give employment to 16 Europeans, 23 Chinese, and about 325 Japanese. The establishment was started seven years ago, and since that time much has been done to promote engineering by training native workmen in all branches of engine construction and shipbuilding. Japanese authorities have recognized the benefit resulting from these proceedings, and have shown themselves prepared, in all cases, to promote their success. It has been proposed to establish iron and shipbuilding works under skilled English management, intending to make them thoroughly complete, with all the latest improved appliances, and on a sufficiently large scale to meet the demand for works of considerable dimensions. Numbers of smaller shipbuilding yards and ironworks have been opened of late by Japanese firms, and it is expected that the increasing demand for the construction and repairs of small sailing and steam vessels will, in future, be promptly satisfied.

Very singular and amusing things happen out West. For example: Two years ago, says the Stockton (Cal.) Mail, water came into a mine operated by Mr. Wm. Utter, at Campo Seco, in such volume that work had to be stopped. To keep the large iron-bound and iron-baled bucket used to hoist rock from drying and falling to pieces, it was let down into the water. Next season, when it was drawn up, lo, a miracle! It was copper-baled! From this has sprung quite an industry, and the mine has been sustaining itself from water and ore ever since. The water contains an acid which has the property of taking into solution the particles of iron thrust into it, and it has also copper in solution, which is let go particle by particle as the iron is picked up. It is a simple chemical exchange, and this mine may make another profit still if it will get another chemical into the water which will make the acid lay down the iron which, as a black flood, the water carries down into the Stanislaus River. The copper industry consists in taking bundles of scrap iron and tin to the mine, where it is thrust into vats of the water caught up, in which the metals are soon changed into copper, the residue of the iron taking the form of a black stream and flowing away. To make sure of making the water swap all its copper for iron, which it is glad to do without boot, one vat is placed below, another down the bank to the river, and when the water escapes it has eaten its fill of iron, and left pay for its meal in genuine copper.

The House bill, reported by the Senate Post Office Committee, appropriates \$2,500,000 for mail service performed by steamships built in American shipyards, owned by American citizens or American corporations, and officered and manned by American citizens. They are to be divided into four classes: First, iron or steel screw steamships of not less than 4000 tons burden, and capable of making a speed of at least eighteen nautical miles per hour. No vessel, except of this class, shall be accepted for mail service between the United States and Great Britain, and the rate of compensation for such vessels is limited to \$3 per mile for each outward bound voyage. The second-class ships are to have a minimum tonnage of 3000 tons and a speed of fourteen knots per hour; the third class, 2000 tons and thirteen knots, and the fourth class, 1000 tons and eleven knots per hour. The rates of compensation for the second, third and fourth classes are restricted to \$30, \$25 and \$20 per mile per annum, computing the distance only one way and upon the basis of one trip per month, or pro rata upon the basis of more or less frequent service.

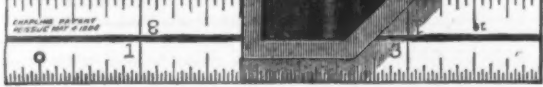
The steamship Lord Collingwood, which sailed from this port on the 3d inst., was laden almost entirely with agricultural implements for Sebastopol and Odessa, and was engaged to meet the requirements of manufacturers here to deliver goods early in April for the agricultural season in Russia.

## Worcester Free Institute.

The annual catalogue of the Worcester Free Institute is at hand, and contains much matter of interest to those connected with educational matters. Prof. Charles O. Thompson, A. M., Ph. D., is the president. The school was chartered in 1865, and opened for students in November, 1868. It has graduated ten classes, aggregating 200 students. The number of students in attendance during the past year has been good, and there seems to be an evident desire in the Eastern States to make the most of the facilities this institution affords. Connected with the school is a machine shop, at which are manufactured a variety of tools, engines and every-grinding machinery of every description. The candidates for admission must be sixteen years of age, and show proficiency in the common English branches. The entrance examination is merely intended to satisfy the faculty that the candidate gives reasonable promise of success in the studies of the Institute. In its work the Worcester Free Institute stands high, and may be well classified as one of the first institutions of the kind in

## CHAPLIN'S PATENT

TRY SQUARE AND MITRE, SPIRIT LEVEL AND PLUMB.



## A CARD.

This Tool is manufactured under the original patent granted O. R. Chaplin, May 8, 1866, reissued May 4, 1880, for a Combined Square and Bevel, having an adjustable or sliding blade drawn to its seat by a clamp bolt. The public are hereby cautioned against the sale or use of a similar tool made and put into the market by another party, fraudulently claiming the invention as his own, under the name of "Starrett's Patent Adjustable Square." Proceedings in the U. S. Court for the District of Massachusetts were commenced against said party for infringement of the Chaplin Patent in July, 1880, and a final hearing was reached at Boston the second week in January last. The case now only awaits the arguments and decision of Judge Lowell. The aforesaid pretended inventor has recently commenced a counter suit against us, apparently for the express purpose of trying to frighten dealers by threat of suit for damages from handling the Chaplin Tool. All we have to say to the trade in this matter at present is, that we shall firmly maintain whatever rights the Courts may establish in our behalf, and shall protect and defend all parties whomsoever in the use and sale of the Chaplin Tool manufactured by us.

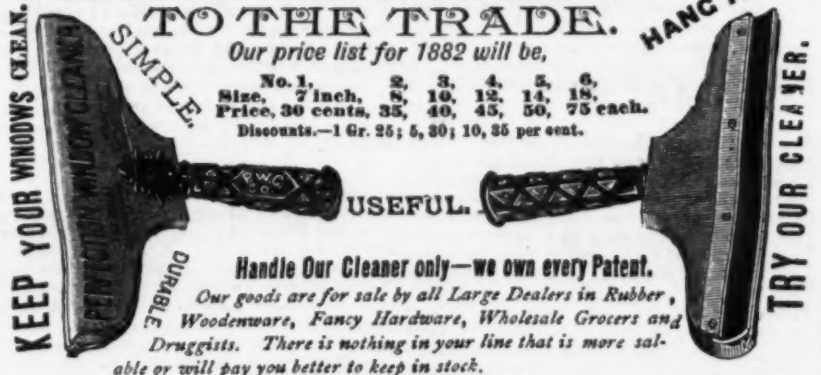
STANDARD TOOL CO.,  
ATHOL, MASS.

SOLE MANUFACTURERS AND OWNERS OF PATENT.

PERFECTION WINDOW CLEANER CO.  
TO THE TRADE.

Our price list for 1882 will be,

No. 1. 2. 3. 4. 5. 6.  
Size, 7 inch. 8. 10. 12. 14. 16.  
Price, 30 cents, 35, 40, 45, 50, 75 each.  
Discounts.—1 Gr. 25; 5, 30; 10, 35 per cent.



Handle Our Cleaner only—we own every Patent.

Our goods are for sale by all Large Dealers in Rubber, Woodware, Fancy Hardware, Wholesale Grocers and Druggists. There is nothing in your line that is more saleable or will pay you better to keep in stock.

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WILEY & RUSSELL MFG. CO.,  
GREENFIELD, MASS.,

## Lightning Screw-Cutting Machinery and Tools.

Celebrated Lightning Screw Plates.

Lightning Bolt Cutters, both for Hand and Power, in great variety.

Taps and Dies for use in Machines, Screw Plates, Bit Brace, Drilling Machines, &amp;c.

Green River Tire Upsetters,

Green River Horse Shoers' Vises,

Green River Drills,

Green River Tire Benders,

Tire Measuring Wheels, &amp;c., &amp;c.

Bit Brace Reamers, and other Labor-

Saving Tools, for Blacksmiths

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If set of No. 6 with 14 sizes taps and dies, making perfect screws at a single cut, tap wrench, bit brace holder and holder for lathe use. Price, \$20.

Send for Illustrated Price List.

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## MERCHANT BAR IRON,

Skelp Iron, Splice Bars, Railway Track Bolts, Car, Bridge, and Machinery Bolts, Nuts, &amp;c.

We invite the attention of RAILROAD MEN especially to our make of SPLICE BARS and Track Bolts. Using the best brands of REFINED IRON, and paying close attention to the finish of our manufactures, we are enabled to offer our patrons BOLTS, NUTS, SPLICE BARS, &c., of excellent quality. Our works have been enlarged within a few years; all orders are now executed with promptness; all our work guaranteed.

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HENRY'S PATENT UNIVERSAL CAN OPENERS.

Sample sent free for 30 cents.



For Round or Square Cans, for all Sizes. The verdict of all: "The best in the market."

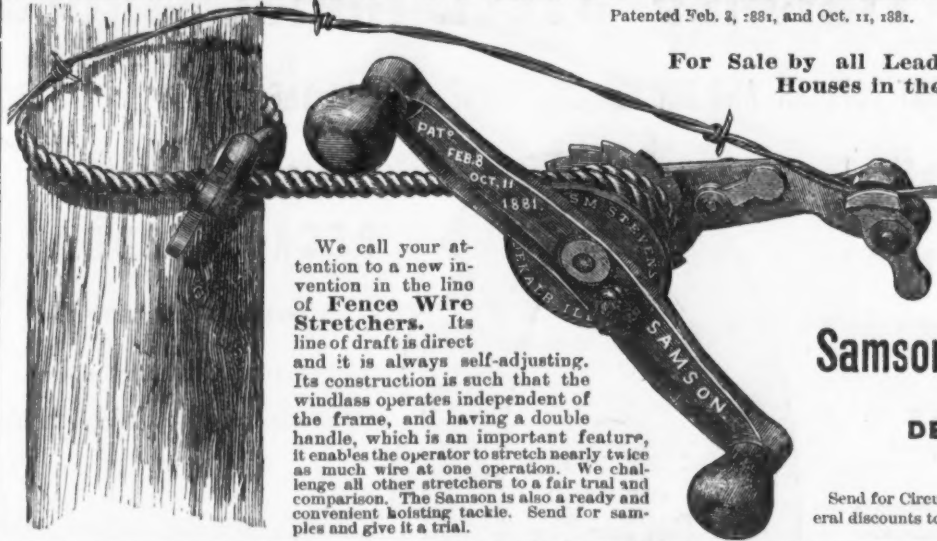
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M. D. SHIPMAN. S. M. STEVENS. C. E. BRADT. S. E. BRADT.  
SAMSON WIRE STRETCHER

Patented Feb. 2, 1881, and Oct. 11, 1881.

For Sale by all Leading Jobbing Hardware Houses in the United States.

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We call your attention to a new invention in the line of Fence Wire Stretchers. Its line of draft is direct and it is always self-adjusting. Its construction is such that the windlass operates independent of the frame, and having a double handle, which is an important feature, it enables the operator to stretch nearly twice as much wire at one operation. We challenge all other stretchers to a fair trial and comparison. The Samson is also a ready and convenient hoisting tackle. Send for samples and give it a trial.

Samson Novelty Works,

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Send for Circulars and Price List, showing our liberal discounts to the Wholesale trade.

Patented Articles of  
MALLEABLE IRON.

NEW pattern Heavy Screw Clamps: strongest in the market.



Hammer's Malleable Iron Oilers, 3 sizes.  
Hammer's Mall. Iron Hand Lamps.  
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For sale by all the principal Hardware Dealers. Send for Price List.

MALLEABLE IRON CASTINGS  
Of superior quality, and Hardware Specialties in Malleable Iron made to order.HAMMER & CO.,  
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NEW MAKE OF MINE



AGENTS IN ALL FOREIGN COUNTRIES.

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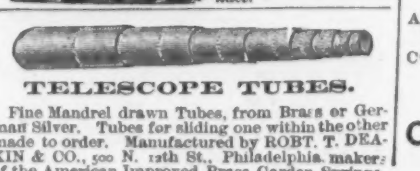
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## BOLT CUTTERS

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(Schlenker's Patent.)

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Fine Mandrel drawn Tubes, from Brass or German Silver. Tubes for sliding one within the other made to order. Manufactured by ROBT. T. DEAKIN & CO., 500 N. 13th St., Philadelphia makers of the American Improved Brass Garden Syringes.

BUFFALO CHAMPION  
ICE CREAM FREEZERS.

FOUR STYLES.

FIFTEEN SIZES.

THE BEST  
ICE CREAM FREEZER  
IN MARKET.

Please send for Illustrated and Descriptive Price List.

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BUFFALO STAMPING WORKS,  
BUFFALO, N. Y.,

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## The "Eureka" Pipe Cutter



THE BODY—is fitted with an adjustable Cast-Steel Jaw at the point where it comes in contact with the Pipe, which Jaw can be renewed at any time by simply removing one screw. By this system the wearing away of the Jaw (which in other cutters is the first part to give out) is effectually prevented, and this tool can be kept in first-class order at all times.

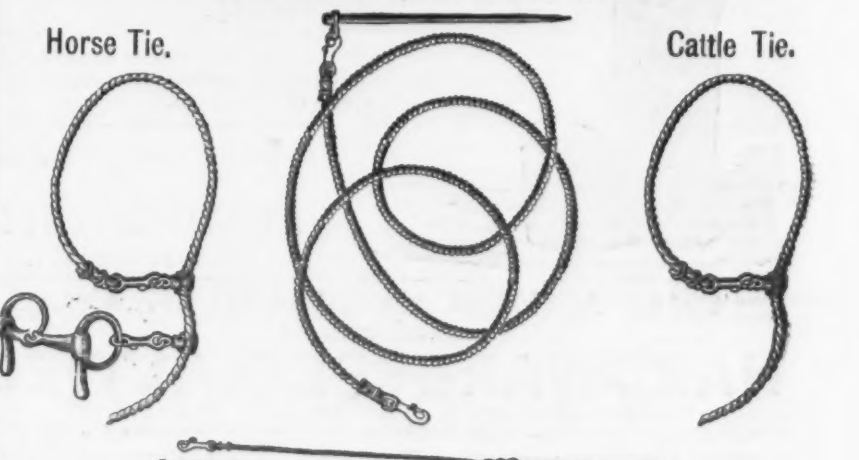
THE WHEEL BLOCK.—This is also of Steel, neatly fitted to its socket and cannot be dropped out. It is much more durable than the cast-iron blocks and is hardened at the point where the rod comes in contact with it.

THE HANDLE—of this Cutter is put on to stay, and cannot be removed by the roughest usage, as it is an iron handle, cast fast to the Rod, operating the block.

—MANUFACTURED BY—

Pancost & Maule  
243 & 245  
SOUTH THIRD  
STREET  
PHILADA.

Covert Lariat Tether and Picket Pin.



## Covert's Celebrated Rope Goods,

CONSISTING OF

HORSE TIES, CATTLE TIES, HALTERS,

Cotton and Jute Double and Single Driving Reins, Weight Cords,

HITCHING CORDS, LARIAT TETHERS AND PICKET PINS,

All clamped with the PATENT COVERT STEEL RING CLAMP, and fully warranted and guaranteed.

These goods are superior to anything of the kind in the market and are a great deal cheaper. Also

COVERT'S PATENT HARNESS SNAPS, OPEN EYE BIT, CHAIN AND TRACE SNAPS, SWIVEL

SNAPS, BREST CHAINS, REIN CHAINS, &amp;c.

Sold by leading Jobbers at Manufacturers' prices. Send for Catalogue and Price List.

COVERT MFG. CO., Sole Manufacturers,

WEST TROY, N. Y.



## Special Notices.

To Buyers of Table Cutlery.

**E. BISSELL & CO.,**  
WHOLESALE AUCTIONEERS.Large, Special and Peremptory Sale  
By Order of the Cutlery Association  
of the United States.**American Table Cutlery,**  
Carvers and Butcher Knives,  
&c., &c., &c.,  
Second Quality.**ON WEDNESDAY AND THURSDAY,**  
March 29th and 30th, 1892,  
At 10 o'clock a. m. each day,  
AT OUR SALESROOMS, 83 CHAMBERS  
AND 65 READE STS., NEW YORK.As this is the first sale made by the CUTLERY  
ASSOCIATION this year, it will be a very im-  
portant one for all buyers of TABLE CUTLERY, as it  
will comprise over 40,000 dozen Table Knives and  
Forks, desirable patterns, in Ebony, Cocoa and  
Bone, of the manufacture of the Lamon & Good-  
now Mfg. Co., Landers, Frary & Clark, the Frary  
Cutlery Co., Meridian Cutlery Co., J. Russell Cut-  
lery Co., American Cutlery Co., and the Beaver  
Falls Cutlery Co. Also a full line of Butcher  
Knives, Butter Knives, Carvers, Ivory Carvers,  
Tea and Table Spoons and Forks, plated on 18  
percent nickel silver, standard and guaranteed plate.  
Several hundred dozen Plated Steel Knives, 5, 12, 13  
and 16 oz. plate. Also a large invoice of Solid Steel  
Japanned and Nickel Plated Straight and Bent  
Trimmers and Barbers' Shears, Pocket Cutlery,  
&c., &c.Buyers who cannot attend the sale can forward  
their orders, and goods will be purchased without  
extra charge. Purchasers of Cutlery should not  
neglect this opportunity to replenish their stocks  
at their own prices, as they will probably not have  
another such chance this season. Catalogues will  
be ready by March 25th, and will be sent to those  
who desire them. The entire Catalogue will be  
sold without reserve.**FOR SALE.**—A thriving Hardware, Crockery  
and Housefurnishing Goods business. Busi-  
ness established nearly 30 years, and the large  
trade done in 1891 of any year since established.  
Stock in clean, neat shape, no old dead stock;  
will invoice from \$14,000 to \$6,000. No one need  
apply unless they have capital and energy to keep  
the business up, as the proprietor can and will  
continue it unless the right person is found to sell to.  
Address for one month,  
ILLINOIS,  
Office of The Iron Age, 83 Reade St., New York.

## NOTICE.

We are in position to handle Heavy Hardware,  
Iron and steel goods for manufacturers, and are  
ready to correspond with those who desire to  
place their products on sale at this point.  
STEWART & LAYTON,  
Railroad and Machine Shop Supplies,  
286 West Second Street, Cincinnati, Ohio.

## A Young Man

Of 27, who has had nine years' experience in the  
iron business, desires a situation. Had charge of  
charcoal furnace and forge two years. Has had  
experience at times. Understands bookkeeping  
and correspondence. Best of references from  
present and former employers. Address  
IRON,  
Office of The Iron Age, 83 Reade St., Phila., Pa.

## Wanted.

To confer with thorough engineer by parties  
who contemplate engaging in the manufacture of  
Iron and Steel in all its branches, Crucible, Open-  
Heart and Bessemer. No one need apply who is  
not strictly practical and capable in every detail,  
and competent to take entire management. Lib-  
eral compensation guaranteed. Address  
Address, C. J. M., P. O. Box 1278, New York,  
giving reference.

## Situation Wanted

By a thorough Hardware man. Will be open for  
engagement May 1st.  
Address, J. R.,  
65 Fountain St., Providence, R. I.

## Wanted.

An experienced Hardware Salesman, who can  
command a trade, to travel through New England.  
Address  
HARDWARE,  
Box 180, Boston, Mass.

## Resident Buyer.

A party having had about 13 years' experience  
in New York City in the Hardware, Iron and Nail  
business, is desirous of representing a few first  
class Southern and Western houses as resident  
buyer, either on salary or commission. Is ac-  
quainted with all the leading manufacturers. Can  
furnish satisfactory references. Address, S. J.,  
Office of The Iron Age, 83 Reade St., New York.

## LOWERRE &amp; TUCKER,

MANUFACTURERS OF  
MRS. KNOX NO. "99," CROWN JEWEL  
AND REGAL  
FLUTING MACHINES  
And other Light Machinery.

393 Mulberry Street, March, 1892.

As our Mr. Lowerre intends to retire from busi-  
ness, he will sell out his half interest to any gentle-  
man of respectability and means that may be  
acceptable to Mr. Tucker.

LOWERRE &amp; TUCKER

## Retail Salesman Wanted

In the Retail Department of a New York City  
Jobbing Hardware and Cutlery House. An ener-  
getic salesman. Must be familiar with the wants  
of the city, and not afraid of work.  
Address, giving references and former position,  
THOMAS,  
Office of The Iron Age, 83 Reade St., New York.

## Situation Wanted

in a Wholesale Cutlery and Hardware House.  
Sixteen years experience. References. Address  
CUTLERY,  
Office of The Iron Age, 220 S. 4th St., Phila., Pa.**WANTED.**—A position by a thorough hardware  
man aged 40; has held positions as follows:  
Purchaser, Salesman, Traveler, Bookkeeper,  
Cashier, Secretary. First-class in all, with best  
testimonials. Address,  
"HARDWARE," 56 East 131 St., New York.**DILL GREEN FOR SALE.**—A new Upright Power  
Roll Press, swings 22 inches, back geared, quick  
return motion, steel cylinder and shaft superior  
build; weighs 1,200 lbs. Price, \$100.  
F. L. PRATT & SONS, NEW YORK.

## Special Notices.

For Sale.

**Palo Alto Rolling Mills,**

Near Pottsville, Pa.,

ON THE MAIN LINE OF THE POTTSVILLE  
AND READING RAILROAD.These mills are in good repair, and can be  
started in two days' time.  
Rolls for T-Rails 12 to 20 lbs. per yard, and for  
Street Rails 8 to 10 lbs. per yard.  
Guide Mill Train for Merchant Iron 3/4 to 1 inch.  
Rolls for Merchant Bar, round and square, up to  
4 1/2 inches.  
Number of Puddling Furnaces in both mills,  
30; Heating Furnaces, 2; all with boilers attached.  
Also Foundry, Machine Shop, Blacksmith Shops,  
Iron House, Roll House, Carpenter and Pattern  
Shops, Stables, handsome Dwelling for Superin-  
tendent, 11 Tenement Houses, a Brick Office, and  
ample grounds for stock and elnder.  
For further particulars address  
Messrs. LEE & McCAMANT, Extrs.,  
Pottsville, Pa.THOS. F. WRIGHT, 1834 Race St., Philadelphia, Pa.  
HUGH W. ADAMS, 36 Pine St., New York.

## Manufacturing Property for Sale.

The Real Estate of the late Foundry and Ma-  
chine Company of Taunton, Mass. Buildings con-  
sist of Foundry, Machine, Erecting and Black-  
smith Shops, and covering about 60,000 square  
feet of ground. For particulars apply to  
THE GEORGE PLACE MACHINERY AGENCY,  
121 Chambers St., New York.

## Car Works for Sale.

Present output about five cars daily. Either a  
personal interview, or full particulars may be ob-  
tained, by addressing the owner, X. Y. Z.,  
Office of The Iron Age, 83 Reade St., New York.

## For Sale.

Iron Shapers, 7 1/2 inch stroke, adjustable while  
in motion. Price, \$250 net, f. o. b. Send for  
photo. Address  
NIAGARA STAMPING AND TOOL CO.,  
Buffalo, N. Y.

## For Sale.

Second-hand  
DROPS and LIFTERS.  
BEECHER & PECK,  
Lock Box 122, New Haven, Conn.Foundry & Machine Shop Property  
FOR SALE BY AUCTION.Will be sold on the premises, April 12 next, at 12  
o'clock, all the Real Estate, Foundry and Machine  
Shops, with all fixtures and Tools belonging to  
the FAIRHAVEN IRON WORKS, in Fairhaven,  
Mass., unless the same has been previously dis-  
posed of at private sale.The property is in full operation, and is favor-  
ably situated and well adapted for carrying on a  
large Foundry and Machine Shop business, and  
has excellent freight facilities to either New York  
or Boston. \$100,000 to be paid at time of sale. For  
particulars address  
JOB C. TRIPP, Treasurer,  
Fairhaven, Mass.

## For Sale.

A high 12 inch train of Rolls for rolling billets;  
bed plate in three sections; four pairs stands and  
houseings; will take 6 inch bloom and roll down to  
3/4 inch. Five extra Rolls for same, in first-class  
condition, having turned out fifty tons billets two  
weeks ago. Price 2 1/2 cents per pound, f. o. b.  
Address,  
550 South Third Street, Philadelphia.

## For Sale.

One Beam Engine, 25 x 48, in first-class condi-  
tion in every respect, patent cut-off, Shive govern-  
or, exhaust pipe heater, 18-foot fly wheel, &c., all  
complete. Price \$1200; easy terms.  
SHIMER & CO.,  
250 South 3d St., Philadelphia.

## Wanted.

A thoroughly competent man to take entire  
charge of a Scrap Mill. Address, with references,  
COWAN & BRITTON,  
Gananoque,  
Canada.

## WANTED—Second-hand MACHINERY

One 4000 to 5000 lb. Steam Hammer, 36 to 48 inch  
stroke. Must be in good order.  
One Horizontal Engine, 24 to 30-inch cylinder  
and from 42 to 48-inch stroke.  
One Lever Shear to cut scrap iron up to 15 inches  
wide.Answer by letter, giving full particulars, with  
price and terms to  
NATIONAL TUBE WORKS CO.,  
McKeesport, Pa.

## Wanted.

A second-hand Rolling Mill for rolling Nail Plate.  
Send description and price to  
COWAN & BRITTON,  
Gananoque,  
Canada.

## Wanted.

A Partner with \$2000 to \$50,000 in a Foundry and  
Machine Business, established in 1824. For par-  
ticulars, Inquire of  
I. H. COLLIER,  
Poughkeepsie, N. Y.

## Wanted.

Power Shear for cutting up bar iron scrap, large  
and small. Also small Power Punching Press.  
Also a good Iron Planer. Give weights, dimen-  
sions and prices.  
Box 1012, Post Office, New York.

## Special Notices.

FOR SALE OR TO RENT.

New, light Factory; 70,000 floor feet; 275 H.  
P. Corliss Engine, giving power at minimum  
cost.Shafting, piping, elevator, &c., all complete and  
modern. Lowest insurance rates. Railroad sid-  
ing and ample yard room. Immediate posses-  
sion.A large quantity of General and Special  
Machinery at low prices.SHARPE RIFLE COMPANY,  
Bridgeport, Conn.

## For Sale.

One Upright 35 Horse-Power Engine, with fly-  
wheel and driving pulley. Cylinder 10 inches  
diameter, 20 inches stroke, Judson governor, and  
Plunger Force Pump, 4 inches diameter, 8 inches  
stroke, with brass plungers, brass flanged seats  
and valves. Price \$500, on board cars at Buffalo  
Iron and Nail Co.'s Rolling Mills in Buffalo, N. Y.  
One Fly Wheel, 7 feet in diameter, rim 8 inches  
by 6 inches, with belt pulley 4 feet diameter, 10 1/2  
inch face, double arms, all keyed on to wrought-  
iron shaft 5 inches diameter, 6 1/2 feet long. Price  
2 cents per pound, net.  
One Upright Lever Punch, capacity 3/4 inch hole  
through 3/4 inch plate. The price of machine, with  
full set of patterns, \$87.50. Apply to  
F. L. PRATT, Buffalo, N. Y.

## For Sale.

A Hardware Manufactory, at Westville, Conn.,  
consisting of Foundry, Machine Shop, Stonehouse  
and other buildings; also Water Power, Engine,  
Boiler, Patterns, Tools and Machinery used in the  
same. Address  
THE BLAKE HARDWARE CO.,  
New Haven, Conn.

## For Sale.

The Tyler Hoe and Tool Works, located at  
Ironton, Lawrence County, Ohio. This property  
is well adapted for manufacturing hoes, picks,  
mattocks, &c.; in good repair, and can be  
started immediately. Iron, steel and fuel of best  
quality can be obtained at a minimum cost. Ship-  
ping facilities, both rail and water, are unex-  
celled. Will be sold at a reasonable figure, and  
on easy terms. Address B. M. CALDWELL,  
Secretary, Ironton, Ohio.

## For Sale - - Rolls.

38 Rolls for I Beams.  
THREE-HIGH STYLE.  
For particulars address  
CINCINNATI ROLLING MILL CO.,  
Cincinnati, Ohio.

## Presses for Sale.

Three small Power Punching Presses, in first-  
class order. They have heavy fly wheels; two are  
13 in. diam., and one 16 in. Price \$65 each (cost  
\$150). Also two large new Punching Presses;  
weight, 1200 each; box frame style; height, 5 feet;  
10 inch stroke; opening in bed, 3 x 8; balance  
wheel, 30 x 3 1/2, weighing about 300 pounds.  
PEERLESS PUNCH AND SHEAR CO.,  
115 W. Liberty St., New York.

## For Sale, Cheap.

Forty five Round Tanks, 4 feet diameter, 30 feet  
long, with cast iron heads; as good as new. Also  
a lot of 1 inch Boiler Tubes, from 10 to 14 feet long,  
nearly new, about 25 tons.  
JOSEPH LUMLEY,  
144 N. 3d St., Philadelphia, Pa.

## For Sale.

A complete manufactory, with a business of  
over thirty years' standing, in Agricultural Tools  
& machinery, 70,000 sq. ft. of land to the hardware  
and export trade in the United States. Partic-  
ularly to invest about \$50,000 in a very sub-  
stantial and reliable business, will have every op-  
portunity to investigate in person. Address  
AGRICULTURAL TOOLS,  
Office of The Iron Age, 83 Reade St., New York.

## For Sale.

The largest stock of New and Second-hand En-  
gines, Boilers, and general Machinery in the West.  
Send for Catalogue. Hoisting Outfits for Coal  
Mining and other purposes a specialty.  
WARREN SPRINGER,  
105 to 219 South Canal St., Chicago.

## For Sale.

Horizontal Engines, 18 x 30 inch, slide valve;  
also 16 x 48 (Hewes & Phillips); 16 x 48 cut-off;  
10 x 36 (Carrier), with cut-off; 16 x 28 Upright En-  
gine, with cut-off; one 80 H. P. Locomotive Boiler;  
one 4-ton "Olds" Freight Elevator; No. 5 Knowles  
steam Pump. All the above guaranteed com-  
plete and in perfect order. For particulars ad-  
dress  
BELCHER & BAGNALL,  
40 Cortlandt St., N. Y.

## For Sale.

The Industrial Works of Shamokin, owned and  
successfully carried on for a number of years by  
the late Wm. Brown, deceased, consisting of Foundry  
and Machine Shop, and a large stock of Pat-  
terns regarded as parts of the property. Boiler  
Shop, Blacksmith Shop and Factory for the manu-  
facture of heavy coal cranes. Well located in the  
borough of Shamokin, Pa., with the best facilities  
for shipping by rail, and surrounded by a district  
contributing all the work that a shop of that kind  
can possibly turn out. The works are now run-  
ning but in a very short time possession can be  
given. Easy terms of payment are offered to suit  
a purchaser of limited capital.  
Offered for sale by  
WM. McILVAIN & SONS,  
Reading, Pa.

## For Sale.

Stock of hardware, stoves and implements, and  
store furniture, in one of the best towns in Kansas.  
Address  
HARDWARE,  
Box 366, Salina, Kansas.

## LARGE ENGINE LATHES FOR SALE.

One Lathe, 12 ft. bed, 24 in. swing, screw cutting,  
triple gear, compound rest, with cross-feed.  
One Lathe, 20 ft. bed, 55 in. swing, back gear,  
compound rest, cross and angular feed.  
One Lathe, 10 ft. bed, 30 in. swing, back geared.  
These Tools are in use, and can be seen at our  
factory.THE STILES & PARKER PRESS CO.,  
Middletown, Conn.**WANTED.**—A young man wants a position in  
a first-class Hardware establishment as  
Traveling Salesman, with ten years' experience  
in the General Hardware business, and has some  
experience on the road. Best of refer-  
ence. Address  
P. O. BOX 93, Lewistown, Pa.

## Special Notices.

J. SEIDEL,

Commission Merchant,

Box 662, Habana, Cuba.

Will be happy to accept the representation of  
first-class houses manufacturing hardware.

## Reference:

COLLINS &amp; CO., 212 Water Street, New York.

PROPOSALS FOR CAST-IRON PIPE AND

SPECIAL CASTINGS,

AT NATIONAL SOLDIERS' HOME, NEAR  
DAYTON, OHIO.

## NOTICE TO CONTRACTORS.

Sealed Proposals will be received at the Gov-  
ernor's Office up to 2 o'clock p. m., March 25, 1892,  
for the following, viz.:  
For Cast-Iron Pipe and Special Castings, for  
new Water Works. The sizes of Pipe wanted will  
range from 4 inch to 12 inch, with Special Castings  
for the same, and the total weight will approx-  
imate 35,000 pounds.  
The above Pipe and Specials must be delivered  
free, on board cars, on side-track at Soldiers'  
Home, and the delivery made as soon as possible  
after the signing of contract.  
Specifications will be furnished on application.  
Envelopes containing proposals must be marked  
"Proposals for Pipe, &c., for New Water Works."  
Satisfactory security will be required for per-  
formance of contract, if accepted by the Home.  
The Home reserves the right to reject any or all  
proposals received.

## M. R. PATRICK,

Dated March 10, 1892. GOVERNOR.

## For Sale.

One 20-inch Engine, one 100-horse Locomotive  
Boiler; two large Pulleys, 30-inch face; a 20-inch  
Rubber Belt, &c. All in good order, and will be  
sold for less than value to make room for larger.  
Can be seen running at  
AKRON RUBBER WORKS,  
Akron, Ohio.

## For Sale.

From 750 to 1000 acres of coal land, with two  
5-foot coal seams and all the minerals of Eastern  
Ohio and Western Pennsylvania; has good iron  
or steel manufacturing site, with railroad and Ohio  
River frontage. Inquire for printed circular of  
JNO. C. COUCH, Real Estate Agent,  
152 Fifth Avenue, Pittsburgh.

## FOR SALE LOW.—ENGINE.

A Vertical High-Pressure Steam Engine, com-  
plete. Cylinder, 24 in. by 48 in. Built by A. J.  
Sweeney & Son. Can be seen in daily use at our  
mill factory.LA BELLE IRON WORKS,  
Wheeling, West Va.

## For Sale.

Hardware Stock and Business of twenty years'  
standing, in a live manufacturing railroad town  
in Ohio. Stock about \$25,000. A rare opportunity.  
For particulars, inquire of  
T. B. RAYL & CO.,  
Detroit, Mich.

## For Sale.

A complete stock of Builders' Hardware and  
Agricultural Implements, situated in the growing  
city of BRIDGEPORT, CONN. Clean stock, good  
trade, good location. On account of poor health  
will be sold on easy terms. Address communi-  
cations to  
SARGENT & CO.,  
New Haven, Conn., or  
SARGENT & CO.,  
New York, N. Y.

## Bolt and Nut Machinery, &amp;c., for Sale.

One-Header Lewis Oliver & Phillips, second-  
hand.  
Two-Header Burdick Forged Headers, second-  
hand.  
Two-Header Lowell Forged Headers, second-  
hand.  
One Cold Upsetter or Header, Chapin make,  
second-hand. Will head 6 in. long by 3/4 open dies.  
Two Key-Seal Cutters, most improved style,  
second-hand.  
One Double-Punch and Shears, Allstatter No. 7,  
second-hand.  
One Thorn & De Haven Drill, second-hand.  
One Double-Bolt Cutter, Smith maker, little used.  
Also one full line of National Machinery Co.'s  
machines: Hot-pressed and Hot-forged Nut  
Machines; Bolt Cutters, National Head, 8 sizes;  
Double-Bolt Cutters, Tappers, Headers, Washers,  
Rivet, Track Bolt Pointers, Burrers, and full out-  
fits for Bolt and Nut manufacturers. Address  
NATIONAL MACHINERY CO., Cleveland, Ohio,  
the only Specialists in the United States.

## DESIRABLE MANUFACTURING SITE

## For Sale or Rent.

Being the extensive property formerly occupied  
by the  
BUFFALO IRON AND NAIL WORKS AT BLACK  
ROCK, IN THIS CITY.The buildings cover over three acres, and are of  
brick and wood, substantially constructed, and  
with slate roofs. They could easily be changed,  
if necessary, to suit almost any kind of business.  
Water and railroad communication to all  
parts of the country.  
Maps of the property, with full description, sent  
on application.  
P. P. PRATT or F. L. PRATT,  
Buffalo, N. Y.

## For Sale.

**Two Corliss Condensing  
Beam Engines,**  
32 in. x 72 in. cylinders. Address,  
THE HARTFORD ENGINEERING CO.,  
Hartford, Conn.**FOR SALE.**—Two of Munson Brothers' Patent  
Double Geared Under-Running GRIST MILLS,  
Scotch type, in diameter, counter shafts and  
pulleys, together with an extra set of stones; cast-  
iron cases; all complete and new; best Grist Mill  
made. Maker's price at factory, \$1200. Will de-  
liver all free on cars for \$850. Large Upright Re-  
turn Tubular Boiler, 20 H. P., nearly new. Cost  
\$2000; price \$800. Also injector, steam gauge,  
water gauge and low water alarm combined,  
pump, iron smoke stack, 25 in. diam., 50 ft. high;  
circular saws, wood fiber machine, pulleys, shaft-  
ing, belting, patent bolt heading press; all new;  
will be sold separately or together; a bargain for  
cash. WM. IRWIN, 123 Broadway, New York.

## Special Notices.

JOB LOT.

ELEY BROTHERS'

GENUINE BLUE CARTRIDGE CASES,  
Twelve Gauge.The best paper shell in the market. For sale  
cheap. Supply limited.

ALFRED FIELD &amp; CO.,

93 Chambers St., N. Y.

**ROBERT R. HAYDOCK & CO.,**  
Auctioneers & Commission  
Merchants,No. 75 Murray Street, New York,  
Solicit consignments of  
Hardware, Cutlery, Stamped Tinware, Woodenware, House-  
furnishing Goods, &c., for Sale by Auction.  
Terms and further information may be had by  
addressing P. O. Box 160.

## Factory Sites Given

To any person or firm desiring to locate at  
Rensselaer, N. Y. Lots are situated near junction  
of New York and Northern Railways. Excellent  
location for dwellings in the vicinity. The railroad  
companies as well as the citizens are desirous of  
encouraging any enterprise which promises  
healthy growth. Several factory sites along the  
Croton River are also offered. For full particulars  
address E. W. ADDIS, 7th N. Village Committee.**To Railroads, Mill Owners  
and Contractors.****STRUCTURAL IRON WORK  
FOR SALE.**Having purchased the Ironwork of the Main  
Centennial Building, situated in Fairmount  
Park, Philadelphia, we now offer the same in sec-  
tions to suit purchasers. These buildings can be  
sold in widths varying from 100 to 150 feet, and of  
any height, from 40 feet down to 25 feet, and in  
length from 100 to 700 feet. We have eight Spiral  
Stairways, in all over 800 steps.Plans showing how all parts of these buildings  
may be utilized in railroad depots, &c., have been  
prepared by Messrs. Wilson Bros. & Co., of Phila-  
delphia, civil engineers and architects, and can  
be seen at the office of Mackintosh, Hemphill &  
Co., Limited, Fort Pitt Foundry, Pittsburgh, Pa.,  
or at the office of the company, at Centennial  
Building, West Philadelphia.  
Wishing to dispose of the above quickly, we are  
prepared to offer great inducements to purchasers,  
both as to low price of material and promptness  
of delivery. Any communications addressed to the  
CENTENNIAL STRUCTURAL CO., care of Mack-  
intosh, Hemphill & Co., Limited, will receive  
prompt attention.

## THE PARTNERSHIP

Heretofore existing between Thomas Hamilton  
and Thomas R. Rainier of the Philadelphia Wire  
Works have been dissolved by limitation. Thomas  
Hamilton having purchased the interest of Thos.  
R. Rainier, the business will be continued by the  
undersigned at the old stand, 130 to 132 Vienna  
Street. Thanking you for past favors and solicit-  
ing a continuance of the same, I remain, respect-  
fully yours,  
THOS. HAMILTON.  
PHILADELPHIA, Jan. 1, 1892.

## THE NEW ENGLAND

**Manufacturers & Mechanics' Institute**  
will hold their Second Annual Exhibition at  
Boston, in their specially constructed Exhibition  
Building, the largest in the United States, during  
SEPTEMBER AND OCTOBER, 1892.  
Exhibitors invited from the whole world. Blank  
forms of applications for space sent upon applica-  
tion to  
JOHN F. WOOD, Treasurer,  
38 Hawley Street, Boston, Mass.

## Copartnership Dissolution.

NOTICE is hereby given that by the death of the  
junior partner, Mr. Nathan Anthony, the firm of  
BRADFORD & ANTHONY is this day dissolved.  
The affairs of the firm will be settled by the under-  
signed, the sole surviving partner.  
Boston, June 12, 1891.  
All communications in regard to the affairs of the  
late firm should be addressed to  
BRADFORD & ANTHONY, Boston, Mass.MARTIN L. BRADFORD hereby gives notice that  
he will continue his business under the name of  
"BRADFORD & ANTHONY."  
The estate of the late Nathan Anthony is to be in no  
way interested in the future business whether con-  
ducted under the name of Bradford & Anthony or  
otherwise.  
All business communications should be addressed to  
BRADFORD & ANTHONY,  
374 Washington Street, Boston.  
Importers, Manufacturers' Agents and Dealers in  
Cutlery, Fishing Tackle, Skates.  
See advertisement first issue of each month.

## IRON RAILS. STEEL RAILS.

## THE SPRINGFIELD IRON COMPANY

are open for orders for IRON AND STEEL  
RAILS for prompt delivery.Apply to the Company at Springfield, Illinois  
or to  
JAMES JOHNSTON, Agent,  
30 Pine Street, New York.

## Copartnership Notice.

Mr. H. Bielefeldt has been admitted a partner  
in our business from this date.  
HAMBURG AND NEW YORK, Jan. 1, 1892.

HAMMACHER &amp; DELIUS.

## Rolling Mill and Shears

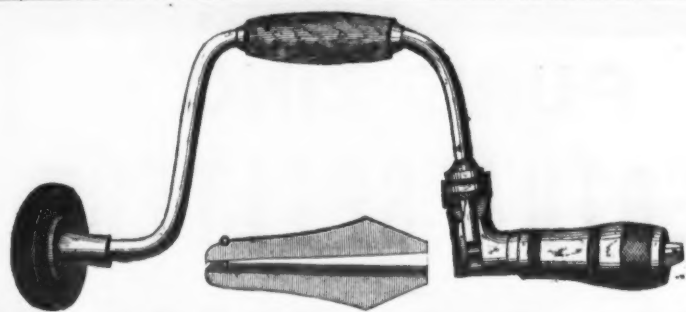
For sale very low. Also Engines and Boilers.  
Lathes

remarked by one of the large speculators, nothing could be more unsatisfactory than the present situation. This is true as regards both the Anthracite and Bituminous departments. In neither branch are sales made at all, except for immediate shipment, on account of the uncertainties of the future. The same may be said to have existed with the



has remained dull, and warrants have relapsed in price to 47/3 on Friday, reviving somewhat to 47/6 and 47/8 to-day. There are now 631,176 tons in Connal's stores, against 528,067 tons a year ago, an increase for the week of 31 tons only. Shipments to date have been 79,367 tons, a total increase of 6797 tons. The importations into Scotland from Middlesboro' have been 52,577 tons, an increase to date of 8095 tons. There are 108 furnaces at work (including 9 on hematites) as compared with 120 this date last year. Writing from Glasgow, on March 4, James Watson & Co. said: "The market for Scotch warrants has been very depressed this week, owing to holders realizing, and a large business has been done at reduced prices. The demand for makers' iron is very quiet and quotations have consequently declined all round. On Monday the market was steady, with a moderate business done from 47/10 to 48/1, cash. On Tuesday the price advanced from 48/0½ to 48/6, cash, closing at 48/4 per ton. On Wednesday the market was quiet, with transactions between 48/3 and 48/1½ per ton. Yesterday the market declined from 48/2½ to 47/7½ per ton, while to-day it has further receded from 47/6 to 47/1½, closing with buyers at 47/3, sellers asking 47/4 per ton. The shipments last week were 10,739 tons, as compared with 11,266 tons for the corresponding week of last year." We quote:

10



## BIT BRACES FOR 1882.

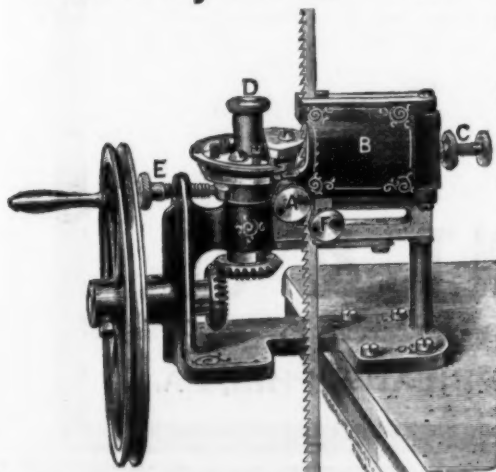
After having made almost every kind of a Bit Brace and tried them on the market, we find that our BARBER IMPROVED BRACE, as seen in this Cut, is the only one which gives universal satisfaction. During the past six months we have made some slight changes on this Brace, which remove all objections to it and make it absolutely perfect. We are aware that other Braces are sold at a less price, but they are also made at a less cost. Everything which goes into the Barber Brace is of the best and most expensive quality, and one of them will outlast six of any other kind. The Sweeps and Jaws are of steel, the Head of lignumvitæ and Revolving Handle of rosewood. It is highly polished and heavily nickel plated. The Jaws will hold, without any fitting, Tool Shanks of every shape, including Round Twist Drills. When furnished with the Ratchet Attachment, for boring in places where the Sweep cannot be revolved, it is the only Brace which will answer that purpose. We have not changed the price for many years, and do not anticipate any change in the near future; but from year to year we have been adding to the quality so as to make the cost to us double what it was ten years ago. We have recently added to our manufacturing facilities, and are now prepared to supply the world with Braces.

### LIST PRICES.

No. 10—14-inch Sweep, per dozen... \$33.00	No. 14—6-inch Sweep, per dozen... \$21.00
No. 11—12-inch Sweep, per dozen... 30.00	No. 31—12-inch Sweep, per dozen... 39.00
No. 12—10-inch Sweep, per dozen... 27.00	No. 32—10-inch Sweep, per dozen... 36.00
No. 13—8-inch Sweep, per dozen... 24.00	No. 33—8-inch Sweep, per dozen... 33.00

MILLERS FALLS CO., 74 Chambers St., New York.

## Amesbury's Band Saw Filing Machine.



Will Save Its Cost in a Few Weeks.

Any boy that can turn a crank can file a band saw in from five to ten minutes more accurately than an expert filer can do the same by hand in one hour. Keeps the teeth even and level, and enables the saw to do more and better work with much less strain. Pronounced by users to be the best labor-saving machine ever introduced.

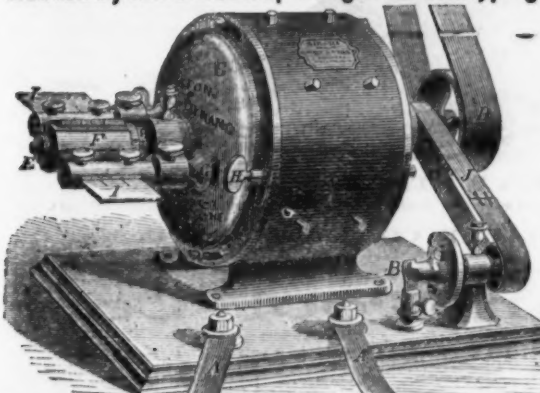
First Premium and Diploma of St. Louis Agricultural and Mechanical Association, 1881, awarded for

BEST BAND SAW FILING MACHINE.

Is sold at a price within the reach of every one using a band saw. Reduced Price List.—Net price, including 20 files, \$32; thin, corner and 1 facing files, per dozen, \$1.20; thick beveled files, per dozen, \$1.50. Terms strictly cash. Send for Catalogue and Testimonials.

G. W. AMESBURY & CO.,  
3101 and 3103 Chestnut Street,  
Philadelphia, Pa.

HANSON & VAN WINKLE, Sole Agents for  
Weston Dynamo Electroplating & Electrotyping Machines, Newark, N. J.



For Nickel, Bronze, Brass, Copper and Silver Plating.

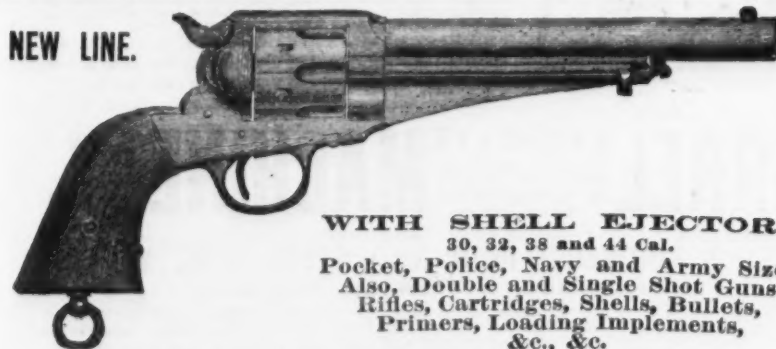
Over 1000 machines in use. Are used by all leading stove manufacturers.

Experienced men sent to put up machines and instruct purchasers.

INFRINGEMENTS.—We call attention to infringements of the Weston Machine in which Automatic Switches are used to prevent change of current. The Weston Co. are owners by grant or purchase of all forms of Automatic Switches for Plating Machines. The adoption of these machines will certainly lead to great loss to parties purchasing or using them.

MANUFACTURERS OF  
Cast Nickel Anodes, Pure Nickel Salts, Polishing Materials.

Manufactory, Newark, N. J. New York Office, 92 & 94 Liberty St.

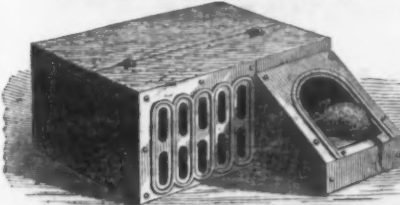


WITH SHELL EJECTOR  
30, 32, 38 and 44 Cal.

Pocket, Police, Navy and Army Sizes  
Also, Double and Single Shot Guns,  
Rifles, Cartridges, Shells, Bullets,  
Primers, Loading Implements,  
&c., &c.

Send for reduced catalogue and discounts of goods manufactured by  
**E. REMINGTON & SONS,**  
283 Broadway, NEW YORK.

THE DELUSION. THE GEM CARPET STRETCHER.



Patented June 6, 1880.  
The Best and Cheapest in Use.

DIRECTIONS.—Tack the carpet at one side of the room, then go to the other side, and with the Stretcher draw the carpet into place, leaving the spar a few inches from the base-board. Take up the slack in the carpet under the spar and drive the spar gently into the floor; it will hold the carpet in place while you drive the tacks. Manufactured by

CLAUDIUS JONES & CO., Erie, Pa.

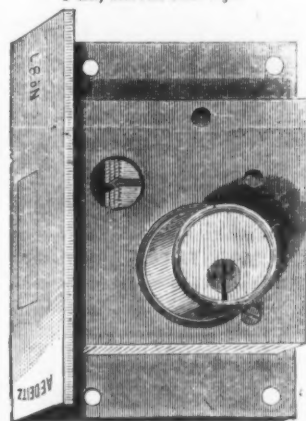
CHARLES H. HOWELL & CO.,

MANUFACTURERS OF FIRST QUALITY

PAINTS, COLORS, OILS, VARNISHES, DRYERS.

212, 214 & 216 Race St., Philadelphia, U. S. A.

A. E. DIETZ,  
(Successor to Barnes & Dietz.)  
Manufacturer of  
Store Door Locks, Night Latches, Padlocks, Drawer Locks,  
&c., with Flat Steel Keys.



Durrie & McCarty, Agents,  
97 Chambers & 81 Reade Sts., New York.

THE FORSYTH SCALE CO.,  
YOUNGSTOWN, O.,  
Manufacture a full line of

FORSYTH'S STANDARD SCALES  
Counter, Portable, Dormant,  
Stock and Hay, and  
R. R. Track

SCALES.

Call Special Attention to their  
SUSPENSION HAY & R. R.

TRACK SCALES.

Also, Warehouse Trucks and Letter Presses.

PRINCIPAL WAREHOUSES,

DURRIE & McCARTY, New York;

FORSYTH SCALE CO., Chicago;

SIMMONS HARDWARE CO., St. Louis.

### PRIZE MEDALLISTS:

Exhibitions of 1866, 1867, 1872, 1873, and only award and medal for Noiseless Steel Shutters at Philadelphia, 1876; Paris, 1878, and Melbourne, 1881.

CLARK, BUNNETT & CO.,  
LIMITED.

Late CLARK & COMPANY,

Original Inventors and Sole Patentees of

Noiseless Self-Coiling Revolving

STEEL SHUTTERS,

FIRE AND BURGLAR PROOF. ALSO IMPROVED

ROLLING WOOD SHUTTERS,

Of various kinds. And Patent

METALLIC VENETIAN BLINDS.

Endorsed by the

Leading Architects of the World.

Office and Manufactory,  
162 & 164 West 27th St., N. Y.

W. W. CULBERTSON, President.

A. FLUMER, Sec'y, Treas. and Gen'l Manager.

THE

QUEEN CITY MALLEABLE IRON CO.,

Make all Shapes and Sizes of

Malleable Iron Castings

known to the trade. Our specialty is

WELDING MALLEABLE CASTINGS.

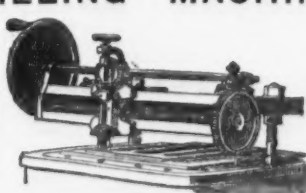
Guaranteed to weld perfectly and capable of being drawn under a hammer. Address,

N. W. Cor. Vine and Second Sts.,

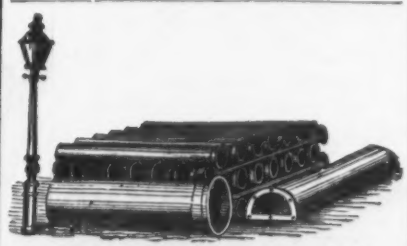
Works, 585 & 587 Eastern Ave.,

CINCINNATI.

STEAM CHEST SEAT  
MILLING MACHINE.



L. B. Flanders Machine Works,  
No. 1025 Hamilton St., Philadelphia, Pa.



R. D. WOOD & CO.,  
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Manufacturers of

Cast Iron Pipe

FOR WATER AND GAS,

Lamp Posts, Valves, &c.,

Mathew's Pat. Anti-Freezing Hydrants.

400 CHESTNUT STREET.

## L. COES' Genuine and Mechanics PATENT Screw Wrenches

MANUFACTURED BY  
**L. COES & CO.,**  
Worcester, Mass.  
ESTABLISHED IN 1839.

Our Genuine Wrenches are made with straight bars, full width and enlarged jaw, having ribs cast inside, which strengthen the jaw and give a full bearing on front of bar. These improvements, in combination with our new ferrule, made with double bearings, an iron tube, fitted to the shank and resting against the lower bearings, rigidly held in position by the handle and nut, effectually preventing back thrust of ferrule (see sectional view), verify our claim that we manufacture the heaviest and strongest Wrench in the market. None genuine unless stamped.

**L. COES & CO.,**  
Worcester, Mass.

Warehouse,  
97 Chambers and 81 Reade Sts.,  
NEW YORK.

DURRIE & McCARTY,  
Sole Agents.

## CHAMPLAIN Forged Horse Nails.

MANUFACTURED BY THE  
**NATIONAL HORSE NAIL CO.,**  
Vergennes, Vermont.

HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST NORWAY IRON AND WARRANTED.

A full line of "CHAMPLAIN" and "NATIONAL" Nails always on hand at our Warehouse,  
97 CHAMBERS AND 81 READE STREETS, NEW YORK.  
DURRIE & McCARTY Sole Agents.

## The 1882 Pennsylvania Lawn Mower.

OUTSTRIPS ALL COMPETITORS. PREMIUMS TAKEN OVER ALL OTHER MOWERS.

EVERY MACHINE WARRANTED TO WORK AS REPRESENTED.

Also Manufacture the  
BEST 10-INCH FORWARD CUT LAWN MOWER in the MARKET, named "QUAKER CITY."  
For descriptive catalogue and prices write to  
LLOYD, SUPPLIER & WATSON, Philadelphia.

## PHILADELPHIA SMELTING COMPANY, Limited.

S. E. Cor. Twelfth and Noble Sts., PHILADELPHIA.  
GENUINE BABBITT, Guaranteed at a speed of 10,000 a minute, and at any pressure for 10 years.

Office JAMES BUTTERWORTH & SON, Manufacturers of Woolen Machinery, 262, 264 and 266 E. Adams St., Philadelphia, October 19, 1881.

PHILADELPHIA SMELTING COMPANY.—GENTLEMEN: We have been running your "Genuine Babbitt" on our wood drilling machine for the last eight years at a speed of 9000 revolutions per minute, without renewal. We have found it to be the best metal we ever used.  
Yours truly,  
JAMES BUTTERWORTH & SON.

Superior to Phosphor Bronze or any other alloy of Copper and Tin for Machinery Journals.  
PHILADELPHIA, October 4, 1879.  
"Deoxidized Bronze" as journal boxes in our rolling mill, where great pressure is required, we take pleasure in recommending it as being superior to any we have heretofore used.  
Very truly,  
HENRY DISSTON & SONS.

## JACK SCREWS,

Press Screws, &c., Cast with Perfect Seamless Thread by our new patent process. Cheaper than Wrought Iron, not so apt to bend or strip the thread. Liberal discount to the trade.

**SEEGER MFG. CO.,**  
Box 1513, SPRINGFIELD, MASS.

H. E. ASHCRAFT, Agent,  
12 Murray St., and 15 Park Place, New York.

## "The King" Lemon Squeezer

and other Hardware Specialties.  
Manufactured by

**KYSER & REX,**  
Variety Iron Works.

Manufacturers of HARDWARE SPECIALTIES,  
IRON TOYS, NOVELTIES and HOUSE FURNISHING HARDWARE.

Main Office and Factory, FRANKFORD, PHILA.  
Sample Office, 33 South 4th St., Phila.

## The Winter Wheat Crop.

Returns from the principal agricultural districts lately compiled and tabulated are very satisfactory. The most striking feature exhibited by these reports is the high ratio of condition of winter wheats reported from all the States. Very few counties report a falling off in this particular, although in a few States complaints are made of the Hessian fly, chinch bugs and frost, and in several the only drawback feared is the possibility of frost during the present month. As to acreage, the States of Missouri, Kentucky and Indiana show a large increase over 1881, and Ohio, Illinois and Kansas have made a liberal gain in some counties, partly counterbalanced, however, by a loss in others. The three remaining States, Iowa, Minnesota and Wisconsin grow little or no winter wheat, and returns from these were merely obtained for the purpose of ascertaining the present stock of wheat and corn held by growers. But, to notice the facts as to acreage and condition more in detail, of the 34 reports received from Illinois, 10 report an increase of acreage averaging 15 per cent.; 17 a decrease averaging 20 per cent., and 4 an unchanged acreage. Concerning condition, 20 report an improvement over the average, ranging widely from 2 to 100 per cent., but averaging 20 per cent.; while 4 counties report fair condition and 4 a decrease averaging 20 per cent. The replies from Ohio include 27 counties; 13 reporting an average increase in acreage of 12 per cent. and 4 a reduction, averaging 15 per cent. Sixteen counties report an improvement of condition averaging 20 per cent. and 5 a falling off in 13 per cent. Indiana furnishes 21 replies, of which 15 indicate an acreage averaging 15 per cent. larger than last year, 2 a decrease of 20 and 5 per cent. respectively, and the remainder no change. The condition is excellent, none reporting a falling off from the average, and 16 giving an average gain of 23 per cent. In Missouri 46 counties were heard from. In acreage, 28 of these report an increase, rising in individual cases as high as 50 and 60 per cent., but averaging 18 per cent., while 14 show a reduction varying from 5 to 110 per cent., and averaging 30 per cent. The returns of condition, however, are very satisfactory, 34 giving an improvement averaging 23 per cent. and only 3 being of an unfavorable nature. Eleven counties report from Michigan, of which 9 give an increase of acreage averaging 21 per cent. and but one a decrease. The condition in 7 counties was 17 per cent. above the average. Kentucky sends replies from 23 counties, all, with one or two exceptions, being highly favorable. The average increase of acreage in 17 counties was 28 per cent., and the average improvement of condition in 20 counties 39 per cent. There was no decrease of importance in either acreage or condition. From Kansas, returns from 30 counties were received. Of these, 9 report a gain in acreage averaging 18 per cent., and 13 a falling off of 22 per cent. The condition, however, was usually good, 24 counties averaging an improvement of 28 per cent. over the average.

From this summary it will be seen that, on the whole, there is an important increase in the acreage of winter wheat over that of last year, and that the condition of that crop during the last half of February was almost universally much above an average. The result of inquiries as to the percentage of the old crop of wheat and Indian corn still remaining in farmers' hands shows that, of wheat, the proportion left in Michigan and Wisconsin is very small; in Kentucky, Indiana and Minnesota it is moderate, and in Illinois, Iowa and Missouri, large. Of corn, a larger percentage of the crop remains than wheat, the States of Minnesota, Iowa, Illinois and Ohio having each over a third of the crop left, the remaining States also showing a high ratio. The average proportion of the wheat crop in growers' hands, according to these figures, is therefore 23.4 per cent.; and of corn, 30.5 per cent. The following table gives the figures from the different States:

States.	Number of counties reporting		Av. percent. crop remaining	
	Wheat.	Corn.	Wheat.	Corn.
Illinois.....	26	25	10	34
Ohio.....	25	20	23	33
Indiana.....	19	14	28	24
Missouri.....	35	33	20	33
Michigan.....	11	6	24	23
Kentucky.....	12	14	10	21
Iowa.....	22	25	27	35
Minnesota.....	20	15	35	39
Wisconsin.....	11	8	26	28

As these stocks have to provide for seed and for local consumption for about five months, it will be seen that the stocks are relatively very light. In many localities stocks are entirely exhausted, and local consumption will have to be provided for by purchases from other sources. We infer, from the general tenor of reports, that the supplies both of corn and wheat available for Eastward shipment from this time until next August are likely to prove very limited.

Perhaps one of the best methods ever introduced for tempering steel is that employed in hardening the blades of the famous Damascus swords. The furnace in which the blades are heated is provided with a horizontal slit through which a current of cold air from the outside is allowed to enter. This slit is placed on the north side of the furnace and has an exterior flat funnel-shaped attachment by which the wind is concentrated and conducted into it. The operation of tempering was, as a rule, performed only on those days of winter when a strong north wind prevailed, the red-hot blade being lifted out of the fire and gradually cooled in the current of air issuing from the slit. The proper degree of temper is thus often acquired by a single operation.

Herr Dittmar's method of solidifying petroleum consists in heating it in a still to 160° with 2 or 3 per cent. of soap. Vinegar is afterwards used to liquefy it. The method and results were unfavorably discussed at a

recent meeting of the Russian Technical Society, St. Petersburg. It was said that the solidification was not perfect, and that oil leaks out of it which would saturate the proposed wood cases for transport and give off vapors; that the cost for soap would be considerable, and that large liquefying works would be required, and finally that the cost of the processes would not be covered by reduction of cost of carriage.

## Modern Gunnery.

Within the past few years the attention of artillerymen has been directed to the air-spacing of cartridges, as the probable key to the secret of high velocities, and methods have been devised of introducing the air and regulating the quantity with great precision. Colonel Maitland, of the royal gun factories at Woolwich, England, has, however, taken another step in advance by abandoning air spacing as an unprofitable expedient, and trying another system. Having found slow-burning powder best adapted to his requirements, he designed a contrivance for retaining it in the chamber of the gun until sufficiently fired to produce a pressure of about two tons per square inch upon the base of the shot, which then starts with a sudden bound, its speed being accelerated until it leaves the gun. The retention of the shot is accomplished by a ring of metal fixed around it at the base, and so regulated as to size that it will, when placed in the breech, be a trifle larger than the bore through which it has to pass. According to the resistance which it affords will be the period of retention. It has been demonstrated by experiments with field gunpowder that in a very strong vessel the powder may be ignited and converted into gas, but yet held under subjection for an unlimited time. The retention ring is made to surrender at a given pressure, and the requisite conditions for the attainment of maximum velocities thus appear to have been realized. With a 10.4-inch gun a 462 pound shot was fired with a muzzle velocity of 2775 feet per second, the equivalent of which in energy is 16,500 foot-tons, but as the powder charge was somewhat in excess of the service allowance, it is fair to reduce this velocity by about 100 feet. It will even then be far in advance of the speed attained under former conditions. The improvement has been shown in a competitive trial between two experimental guns of 45 tons, one being provided with the air-spaced chamber and the other with the retention ring. The former, with 350 lbs. of powder (rather above its service charge), discharged a 700 lb. projectile at a velocity of 1900 feet per second; the latter, loaded with 400 lbs. of powder and a similar shot of 700 lbs., recorded a muzzle velocity of 2120 feet. These figures represent in energy respectively 17,500 and 20,800 tons per foot, and the advantage in an attack upon armor plates may be assessed in the same proportion. The discovery has created great satisfaction in the English government departments, and is expected to lead to still more important results.

A pump-bob, weighing 16 tons, was recently received at the Comstock mines. It will carry, when in place, 30 tons as a counter-balance to the pump-rod. The combined weight of the balance in the seven bobs at the Union shaft is 210 tons. The weight of the pump-rod and water set in motion by every stroke of the engine is something over 400 tons, run at a speed of from three to ten strokes per minute. Four hundred tons per stroke, 2800 tons per minute, 168,000 tons per hour, and 4,032,000 tons every twenty-four hours, is the weight moved by the pumping engine at the Union shaft.

The death of Maurice Healy, some months ago, at the hands of suspected Mollie Maguire in the Pennsylvania iron regions, was marked by circumstances of peculiar atrocity. While peacefully walking the streets he was approached from behind by several persons and instantly shot dead, without provocation. Pat Dolan was convicted of murder, and five others held for trial, but on the 14th inst. all the latter were unceremoniously released, the Commonwealth not thinking the evidence sufficient to hold them. We doubt whether the majesty of the law is fully vindicated in this termination.

The exhibits at the electric exhibition at the Crystal Palace, London, are rapidly assuming order, and nearly all the leading competing firms have their respective displays into more or less complete practical operation. The exhibition will be a most interesting one, and will have a much more fascinating influence on the general public than the woolen exhibition which closed a few months ago at the Crystal Palace.

## The Sherman Process Co.

9 Pemberton Square, Boston, Mass.,  
Issue Licenses to use the Process for the Manufacture of Iron and Steel  
In the Bessemer Converter, Crucible, Siemens Martin, Puddling, Blast and Cupola Furnaces.  
The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working.  
See page 17 of The Iron Age of Oct. 23th, 1877.

H.B. SMITH MACHINE CO.  
925 MARKET ST.  
PHILADELPHIA  
CELEBRATED  
WOOD WORKING  
MACHINERY  
For Car Shops, Planing Mills, &c.  
Also Machinery for all purposes. Correspond with us.

The Schoenberg Metal Mfg. Co.,  
Manufacturers of  
LEAD PIPE,  
SOLDER, TYPE,  
STEREOTYPE, ELECTROTYPE, AND BARBITT METALS.  
Importers of Block Tin, Antimony, &c. Refiners of Lead, Spelter, &c. Highest price paid for all metals, and all kinds of brass. 328 & 330 East 20th, and 525 & 527 E. 19th Streets, between Avenue A and B, New York.

## J. F. ROGERS &amp; CO.,

107 Liberty Street, NEW YORK.



## EMERY WHEELS AND EMERY GRINDERS.

Buffing and Polishing Lathes, Shafting, Counter-shafting, Pulleys, Hangers and Couplings, Lubricators, Oil Cups, Brass, Tin and Malleable Iron Oilers, Engineers' Oil Seta.

## BONNEY'S PAT. PARALLEL VISES.



12 Different Sizes and Styles.  
from 1 1/2 to 2 1/2 inch width of jaws, and in weight from 1 to 5 lbs. Over 200,000 made and sold in the past four years, with continually increasing demand. We are the only ones making a line of cheap small vises in America. We make, also, and other goods. Send for Price List.  
BONNEY VISE AND TOOL CO., 3015 Chestnut St., Philadelphia, Pa.  
P. S.—We furnish stands for holding full lines of the 12 Vises.

GARRY IRON ROOFING CO.,  
Manufacturers of all kinds of  
Iron Roofing and Crimped Siding,  
Fire-Proof Doors and Shutters.IRON ORE PAINT AND CEMENT.  
79 & 81 Columbus Street, CLEVELAND, OHIO.  
Send for circulars and price lists, No 15.MEDFORD FANCY GOODS CO.,  
95 Duane Street, New York.MANUFACTURERS OF  
Dog Collars, Locks, Leads  
AND BELLS.  
The largest variety in the world. Send for illustrated Catalogue.  
Henis' Self-Basting Broiler.

Makes no smoke; saves all gravy. Is having a large and increasing sale. Price to trade, No. 8 \$2.50; No. 10 \$3.50; No. 12 \$4.50 per doz. Sample by mail, prepaid, \$1.00. Catalogue of Novelties and Specialties free. HENIS BROS. & CO., 119 Fulton St., New York

CUTTERS WILL NOT BREAK.  
THE DERBY BIT CO.  
ANSONIA CONN.  
Bored to 2 & 3 in. Not Complicated.  
DURABLE, STRONG, CONVENIENT.R. Onderdonk,  
Sole Manufacturer of  
LEVER LEMON  
SQUEEZER,  
With Pa. forated Strainer,  
405 Grand St.,  
NEW YORK.THE AMERICAN  
VENTILATING SASH LOCK,  
C. E. STELLER'S PATENTS.  
A secure lock for sash, admitting a thorough ventilation of rooms. For sale in all Hardware Stores. Address  
RACINE HARDWARE MFG. CO.,  
Racine, Wis., Sole Manufacturers.E. P. ROBBINS, M. E.,  
Mechanical, Patent and In-  
ventor Expert,  
CINCINNATI, OHIO.  
For particulars see issue of MarLEIGH'S  
DISCOUNT BOOK  
Specially arranged for the use of the  
HARDWARE TRADE.  
Acknowledged by ALL the best work of the kind ever published. Price by mail ONE DOLLAR.  
Address  
E. B. LEIGH, St. Louis Elevator, St. Louis, Mo.J. E. MERCOTT & CO.,  
MANUFACTURERS OF  
LAMP & BRASS GOODS.  
Metal Spinning Done to Order.  
40 and 42 Mechanic Street, NEWARK, N. J.PURE ZINC  
BERTHA SPELTER.

## BERTHA SPELTER CERTIFICATE OF ANALYSIS.

DEAR SIR:—

The sample of Spelter marked "Bertha Zinc," submitted to me for examination, contains

IRON, - - - - 0.0371 per cent.  
ZINC, - - - - 99.9629 " "  
TOTAL, - - - - 100.0000 " "

Lead, Copper, Cadmium, Manganese, Arsenic, Antimony and Sulphur, were carefully tested for, but with negative results, it being impossible to obtain weighable quantities, although a large proportion of the Spelter was taken for the Analysis.

Very Respectfully,

P. DE P. RICKETTS, E. M. PH., D.,

Assayer and Chemist, cor. 50th St. and Fourth Ave., New York City.

The following letter from the Purchasing Agent of Pennsylvania Railroad explains itself.

## THE BERTHA ZINC MINING AND SMELTING CO.

GENTLEMEN:—

Our chemist has examined the sample of zinc you recently left at Altoona, and pronounces it a very pure article. When you are prepared to put it on the market I will be glad to have you advise me with price.

Yours truly,

ENOCH LEWIS, Pur. Agt.

FOR SALE BY

## MERCHANT &amp; CO.,

AGENTS FOR MANUFACTURERS,

525 Arch Street, PHILADELPHIA, PA.



## HASLUP PATENT STEEL SCRAPER.

The most practical, best working and strongest ever made. Especially adapted for Contractors' use. Sent all others. Manufactured only by  
SIDNEY STEEL SCRAPER CO., Sidney, Ohio, U. S. A.  
Send for Circulars.

## American Tool Co.,

Manufacturers of  
TOOL CHESTS OF ALL SIZES.  
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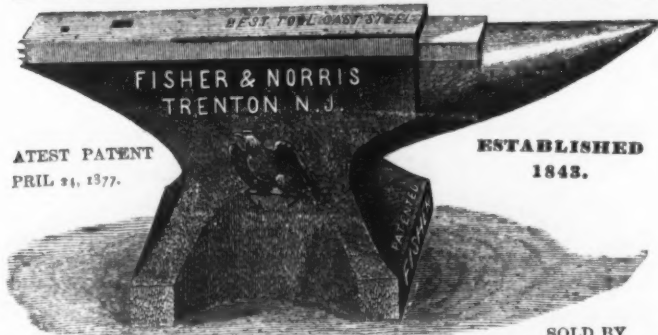
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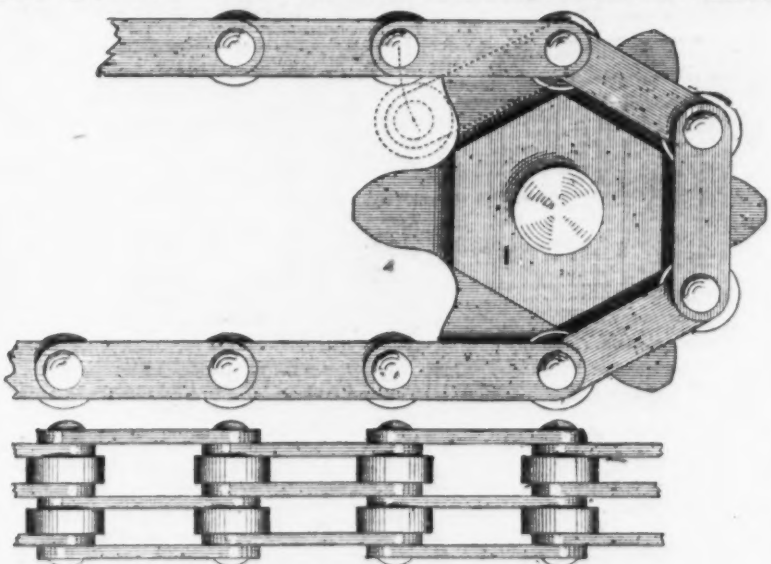
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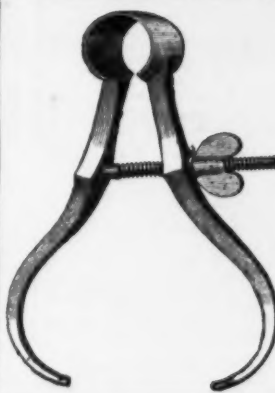
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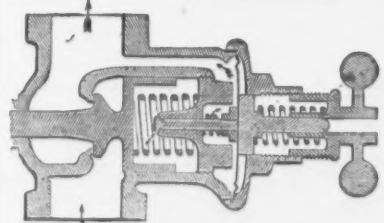
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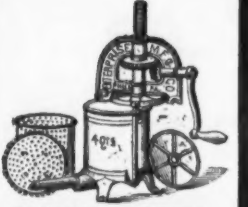
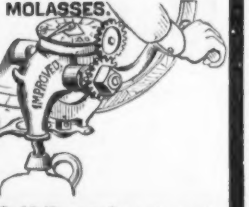

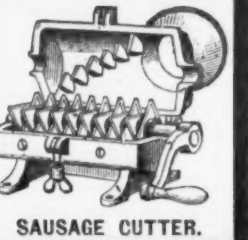
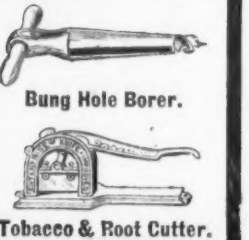
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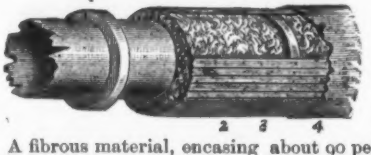
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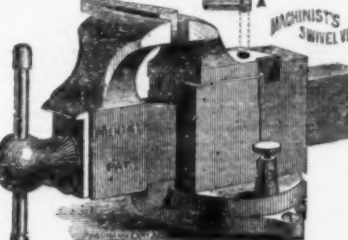
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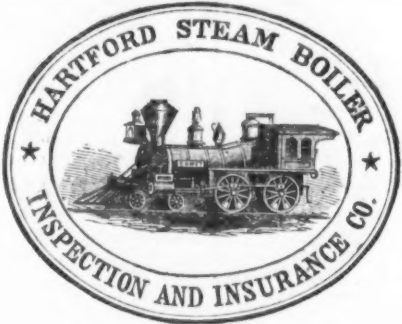
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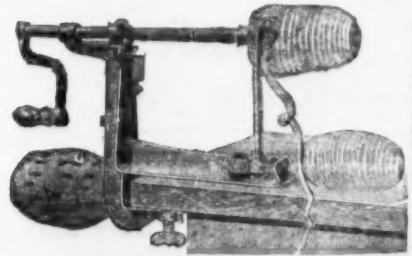
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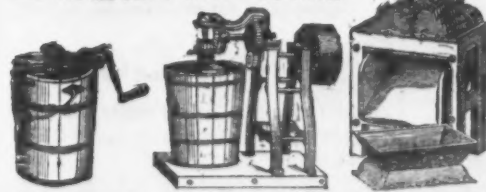
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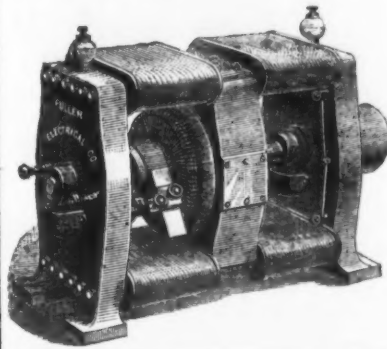


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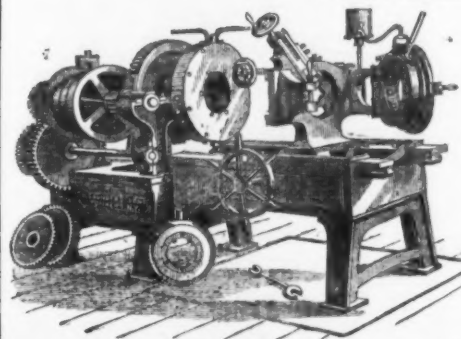
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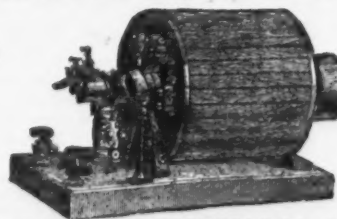
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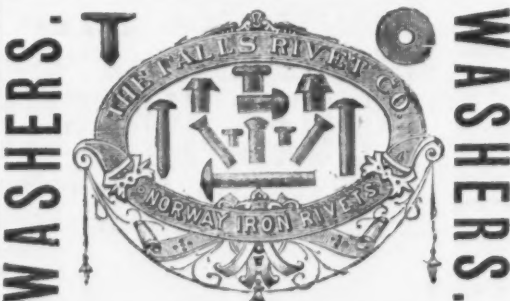
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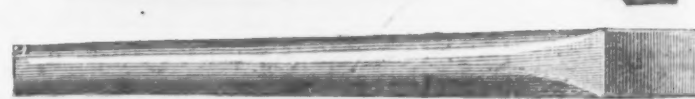
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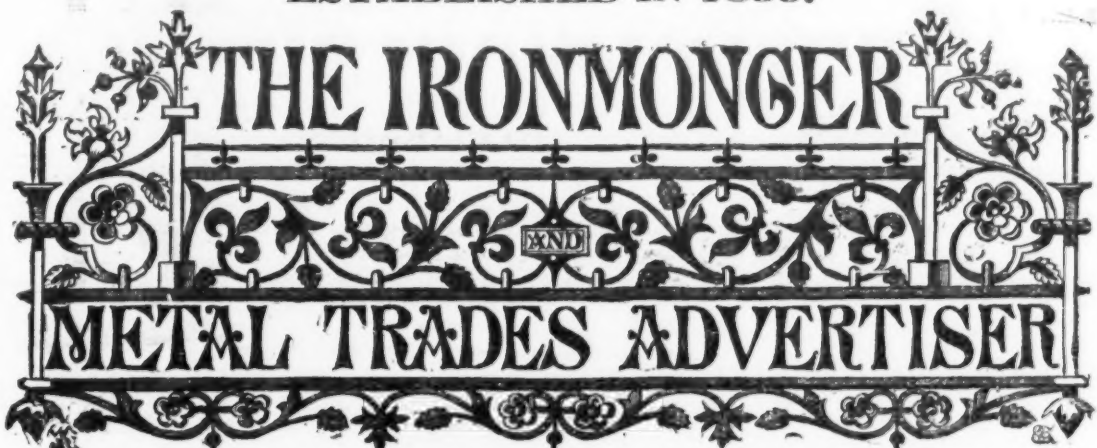
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One Advertisement of every Series of 13 Monthly, 27 Fortnightly, or 53 Weekly, will be inserted in  
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## SPECIAL ISSUES.

In the spring and autumn of each year there is published a Special Issue, the circulation of which is not less than Twelve Thousand (12,000) copies

## THE IRONMONGERS' DIARY AND TEXT BOOK.

This is an annual, presented free to every Subscriber to the IRONMONGER AND METAL TRADES ADVERTISER.  
It contains a large number of ruled skeleton pages for diary and other entries, and in addition much useful reference information, varied from year to  
year. It is handsomely bound in cloth, gilt; and as copies are used in thousands of establishments for a whole year, it is obviously a medium of excep-  
tional value for advertisements. Sold to non-subscribers at 75 cents.

## THE FOREIGN SUPPLEMENT,

With which is incorporated The Universal Engineer.

is published every fourth week in connection with the extensive and world-wide circulation of the Ironmonger itself. The dates of its publication for the  
next twelve months will be as follows:  
MARCH 25, APRIL 22, MAY 20, JUNE 17, JULY 14, AUGUST 11, SEPTEMBER 8 and 30, OCTOBER 27, NOVEMBER 24, DECEMBER 22, 1892.

This Supplement is published in

## FOUR LEADING COMMERCIAL LANGUAGES

of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the Ironmonger not only within reach  
but in the native language of eighty millions of German, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish  
speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to  
be found.

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Advertisers will do well to use illustrations freely. Where economy of space is an object, a left page illustrated and described in one language and a  
right page suitably described in four or more languages on the opposite or right page without illustrating.

## THE WHOLE FOREIGN HARDWARE TRADE

so far as experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or advertise-  
ment inserted in the Ironmonger and Foreign Supplement is a strikingly powerful and most efficient way of publicity not to be compared with any of the  
other ordinary channels of communication.

# HENRY DISSTON & SONS,

KEYSTONE SAW, TOOL, STEEL & FILE WORKS,

Front and Laurel Streets,

PHILADELPHIA.

## DISSTON'S SAMSON TREE PLANTER AND POST HOLE DIGGER.

Fig. 1.

Patented May 29, 1870.

Fig. 2.

Price, - - - \$37.50 per dozen.

No Farmer, Nurseryman, Railroad  
or Telegraph Company  
SHOULD BE WITHOUT ONE.

NO BACK-ACHE.

NO KNEE-WORK.

NO CLOGGING.

This tool has been thoroughly tested, and has given the greatest satisfaction to all who have tried it. The principle on which it works makes it self-cleaning and prevents adhesion in sticky soil; therefore it always works free and easy. It is far superior to all plungers, augers and boring machines, as it works well in stony, sandy, or clay soils; quicksand under water is as easily removed as though no water existed.

### DIRECTIONS.

Plunge the Digger into the ground, as shown in cut, Fig. 1, and when the soil is loosened pull out the lever with one hand, as shown in cut, Fig. 2, which will press the dirt between the blades; then draw the Digger from the hole, keeping hold of the lever with one hand and the handle with the other. When the Digger is clear of the hole, you can deposit the soil anywhere within reach by simply pressing down the lever, which will open the blades and the dirt will fall from between them. The Digger is then ready for another plunge. The steel blades are nine inches long, and the whole tool five feet long. For sale at Hardware and Agricultural Stores.

HENRY DISSTON & SONS.

# BROWER & LEEDS,

No. 81 Murray Street, NEW YORK.

Manufacturers' Agents, and Headquarters for

Peck's "Champion Blade" Axes and Edge Tools,

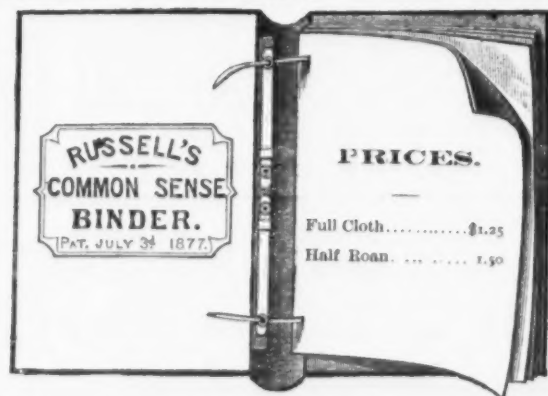
Kerr Brothers & Co.'s Farming Tool Handles,

Bayliss' Hurricane Bellows, Forges and Tuyeres,

Horseshoers' Pincers, Hammers and Sledges,

Sowle's Patent Transom Lifters, "Boss" Scythe Rifles and Sharpeners, Burden's and Perkins' Horse and Mule Shoes, Sweet's Toe Calks and Calking Steel, and all Brands of Horse Nails.

## SELF-BINDERS FOR THE IRON AGE.



We are now prepared to supply our subscribers with an excellent self-binder for their papers, a cut of which is annexed. We call attention to the low prices at which it is offered.

Address all orders to  
**DAVID WILLIAMS,**  
83 Reade Street,  
NEW YORK.

## MORSE TWIST DRILL AND MACHINE CO.

NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,  
Beach's Patent Self-Centering Chuck, Solid and Shell Reamers,  
BIT STOCK DRILLS,

DRILLS FOR COES, WORCESTER, HUNTER AND OTHER HAND DRILL  
PRESSES. BEACH'S PATENT SELF-CENTERING CHUCKS, CENTER  
AND ADJUSTABLE DRILL CHUCKS, SOLID AND SHELL REAMERS.  
DRILL GRINDING MACHINES. TAPER REAMERS, MILLING  
CUTTERS AND SPECIAL TOOLS TO ORDER.

All Tools exact to Whitworth Standard Gauges.

GEO. R. STETSON, Supt.

EDWARD S. TABER, Treas.

JOHN SOMMER'S SON, 8, 10 & 12 Pearl St., Newark, N. J.

Manufacturer of every description

## WOODEN FAUCETS.

Cork Lined, first quality, warranted. Metallic Key,  
Lignumvite Key, Rosewood, Red Cedar, Cherry and  
Butternut Faucets.  
John Sommer's Metallic Key and First Quality Cork-  
Lined Faucets are the best. Send for catalogue.

## The Most Durable and Best Selling Bucket for Chain Pumps.

It has no valves to become obstructed and no screw joints to become immovable by rust.

Advantages of the Crosby Bucket over all others:—1. It has an air chamber on top, which conducts the air to the bottom of the well. 2. It is self-expansive, the base of the bucket being 1/4 of an inch larger at the bottom than bore in the tubes, which allows it to expand and the groove in the side to contract. 3. The wear comes on the whole side, and not on the extreme edge like other buckets. 4. It contains more solid rubber than three of any other manufacture. Three sizes—1 1/4 inch for deep wells, 1 1/2 inch for 40 feet or less, 2 inch for stock pumps. No charge for Territorial Rights. NONE GENUINE unless A. D. Crosby, Patentee and General Agent, Cuba, Allegheny county, N. Y., for sale by W. & B. Douglas, 25 and 27 John St., N. Y., and all General Hardware and Pump Dealers.

Send for Price List. Agents wanted in every county. Address A. D. Crosby, Patentee and General Agent, Cuba, Allegheny county, N. Y. For sale by W. & B. Douglas, 25 and 27 John St., N. Y., and all General Hardware and Pump Dealers.



## GLADWIN IMPROVED BIT OR AUGER.

This Bit will bore through all hard, knotty or gummy woods without being withdrawn. The worm will not clog, owing to the continuance of the channel of the Bit to the extreme point of the worm, enabling it to cut its way and clear itself of shavings, but not injuring its qualities as a screw. This improvement is applicable to any size Auger or Bit having a worm or spur. Dealers, send for price list for renting stock on hand (satisfactory quality and price) and for the Gladwin Bits.  
**GARDNER & CHANDLER, Gen'l Agents**  
122 1/2 Washington St., Boston, Mass.

## PEERLESS SPRING BUTTS AND DOOR SPRINGS.

Our Bronze  
SPRING BUTTS

ARE THE  
HANDSOMEST

In the market.

WE MAKE

ALL SIZES OF

COIL SPRINGS.

Nos. 6, 7, 8 and 9.

TORREY ROD SPRINGS.

TORREY ROD COIL SPRINGS

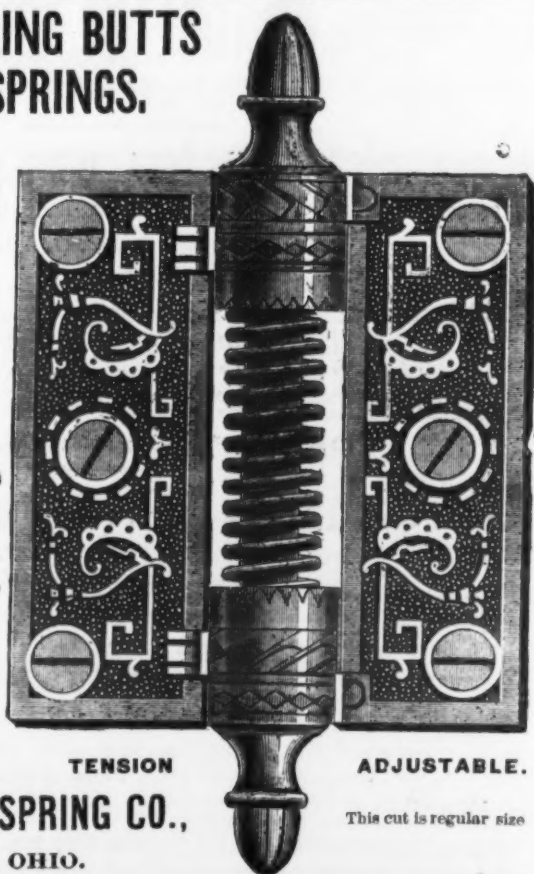
(NEW).

Send for Illustrated Circular and Price List.

Liberal Discount to the Trade.

PEERLESS DOOR SPRING CO.,

CINCINNATI, OHIO.



TENSION

ADJUSTABLE.

This cut is regular size

209 1/2 7th Street St. BURLINGTON, Vt.

## PORTER MANUFACTURING COMPANY.

MANUFACTURERS OF:

PORTER'S PATENT WINDOW & DOOR SCREEN CORNERS ETC.

EVERY ONE HIS OWN WINDOW & DOOR SCREEN MAKER.  
NO MORTISING OR TENDONING, CANNOT SAG OR WARP.  
AND ANYONE CAN MAKE THEM. SEND FOR PRICE LIST.

GRAHAM & HAINES, 113 CHAMBERS ST.  
W. PICKETT & SON, 164 LAKE ST.

THE LEADING WRINGER OF AMERICA.  
**SIMPSON & GAULT (PEERLESS WRINGER CO.),**

New York Office,  
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European Offices,  
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Office and Factory, CINCINNATI, OHIO.

## THE PEERLESS CLOTHES WRINGERS.

Sold by the Jobbing Trade everywhere. Most Saleable Wringer in the market.

MR. L. F. BLUE, who has been in our employ for a great many years, is our SOLE AGENT, and will visit the jobbing trade throughout the United States.

**EATON & PRINCE,**

Manufacturers and Dealers in

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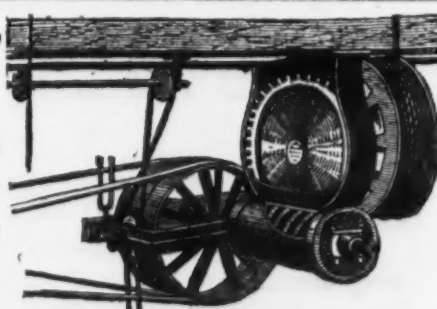
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Hangers, General and Special Machinery,

74 and 76 Michigan St.,

CHICAGO.

Send for prices and mention this paper



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Steel Toe Calk.

FINISHED READY FOR NAILING ON.

WARRANTED

The Best and Cheapest Shoe Made.

**IVES, WOODRUFF & CO.**

Manufacturers,

MOUNT CARMEL, CONN.

For sale by dealers in blacksmiths' supplies.

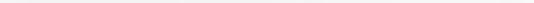
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FINE GRAY IRON CASTINGS OF EVERY DESCRIPTION.  
Rosettes and Pickets for Wire Workers, Castings for Furniture and Piano  
Manufacturers. Iron and Metal Patterns of all kinds a Specialty.  
Correspondence solicited for JAPANNING, COPPERING, BRONZING.

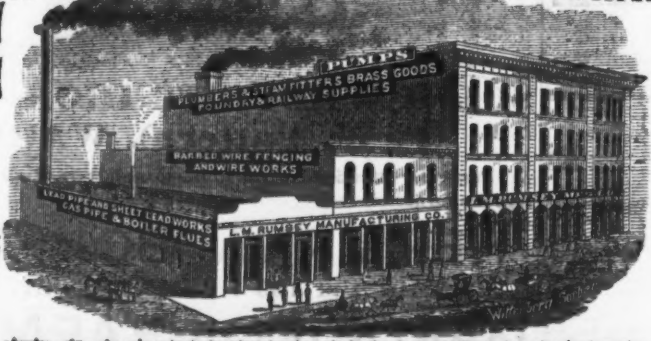
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Quartz, Pumice and Rotten Stone, Crocus, Rouge, Glue, Sand  
Paper, Emery Paper and Cloth, Emery Wheels, &c.

**WALPOLE EMERY MILLS,**  
Mills, So. Walpole. 114 MILK ST., BOSTON, MASS.



**L. M. RUMSEY MFG. CO.**  
MANUFACTURERS & JOBBERS OF  
**PUMPS & IRON WORKING MACHINERY,**



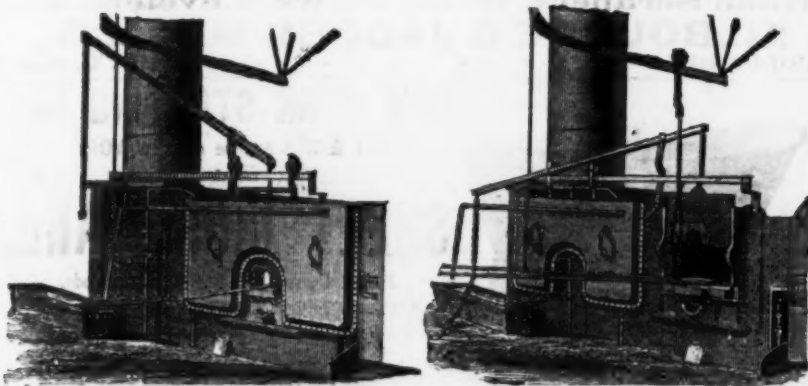
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**BELTING**  
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**PACKING**  
**PUMP**  
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**RAILWAY SUPPLIES**  
N 804 TO 820 N. SECOND ST.  
**ST. LOUIS, MO.**

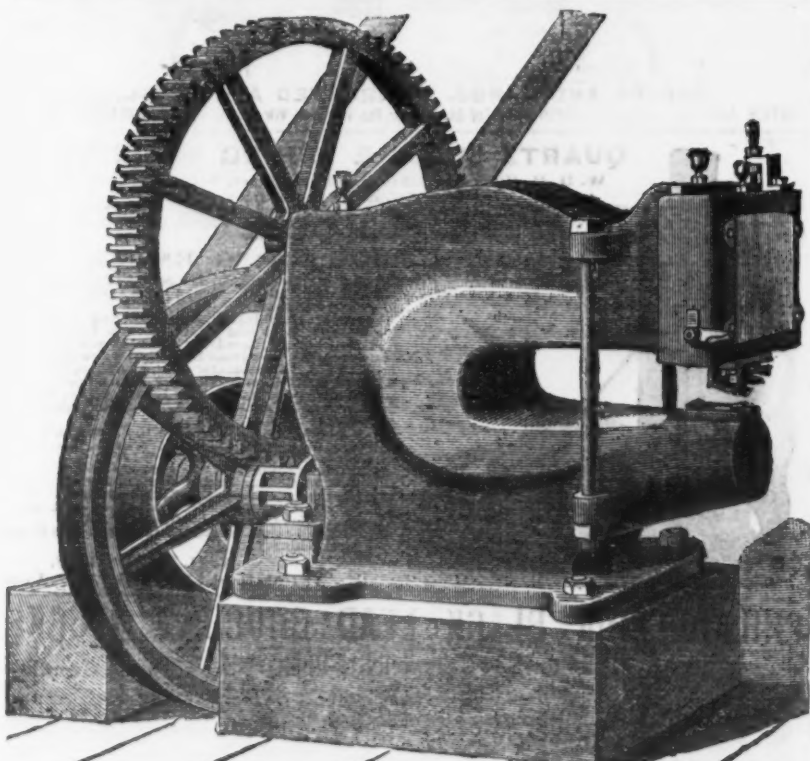
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MANUFACTURERS OF  
**Bolts, Nuts, Washers, Chain Links, Car**  
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# McDONALD'S PATENT SHIELD.



For Protecting the Men from Heat when Working in Front of  
Furnacing, Heating and other Furnaces.

**H. McDONALD, Patentee,**  
MANAGER SLIGO ROLLING MILLS,  
**PITTSBURGH, PA.**



**BOILERMAKERS' PUNCH,**

Punching 1/4 hole in 1/4 plate iron, 1/2 inches from edge, without the side bolts. Weight, 5000 pounds. Larger size punches 1 inch hole in 1 inch plate, 3/4 inches from edge. Weight, 5000 pounds. SHEARS, same design, shear 1/4 and 1 inch plate, 54 and 70 inches wide.

**PEERLESS PUNCH AND SHEAR CO., 115 W. Liberty Street, New York.**

**NIAGARA STAMPING & TOOL CO.,**

Manufacturers of

**Presses, Dies and Tools**

For Working Sheet Metal.

**Fruit Can and Tanners' Tools, &c.**

Works, 147 and 149 Elm Street,

Near Clinton st., **BUFFALO, N. Y.**

**THE DETROIT LUBRICATOR MFG. CO.'S**  
CONTINUOUS FEED  
**Lubricator Cups**

For oiling valves and cylinders of steam engines by the only perfect method.

Through the Steam Pipe  
The oil passes in slight drop by drop, into the column of steam where it vaporizes, thus becoming steam lubricant, oiling perfectly every part reached by the steam. Any clean oil, black or white, light or heavy, may be used. Saves from 50 to 90 per cent. in oil and wear of machinery, thus paying for itself several times a year. A cup will be sent to responsible parties on twenty days' trial, if desired. In ordering

parties on twenty days' trial, if desired. In ordering  
NOTICE.—The first Lubricators ever made, showing the oil passing drop by drop through a transparent water chamber, were devised by us, and the same are fully embraced by many Letters Patent owned and controlled by us. Lubricators of every nature embodying the above features, made by other parties, are encroachments upon our rights, and we will hold purveyors and users, as well as manufacturers, responsible in damages for such violations.

**DETROIT LUBRICATOR MFG. CO.,**  
Office, 98 Griswold St., Detroit, Mich.  
First Prize at Fair American Institute and Millers' International Exposition, Cincinnati, 1880.  
Note.—In our recent suit against the American Lubricator Co., of Detroit, before Justice Stanley Matthews, of the U. S. Supreme Court, involving their infringement of our rights, a decree was rendered in our favor August 30, 1881.

**THE MILLER CO.,**  
Manufacturers of the  
**Torrent and Unique STEAM PUMPS**  
For Boiler Feeding.  
CANTON, OHIO.

For Engines from 5 to 120 H. P. with bracket or base on smaller sizes.  
Price, \$30 and upwards.  
Inexpensive for Engines of all kinds.  
Send for Catalogue.

**THE DUPLEX INJECTOR.**

The Best Boiler Feeder Known.

Unequaled for simplicity and always reliable. Does not require adjustment for varying pressures of steam. Will start when the injector is hot. Less liable to get out of order than a pump. Always delivers water hot to the boiler.

Manufactured and for Sale by  
**JAMES JENKS,**  
16 & 18 Atwater St., East,  
**DETROIT, MICH.**

**DRILL PRESSES.**

New Upright Power Drill Presses, No. 3; swing as inches, back geared, quick return motion, large steel spindle, balanced in column; revolving arm and table; cut Gears; Pulleys, 2 x 3 1/2; a strong brace extends from base to column, stiffening it at point of greatest strain—a new feature. Weight, 1000 lbs.; height, 6 feet. Price, \$210. Small size, swing 13 in., lever feed, three speeds; tight and loose pulleys (no countershaft required). Price, \$35. Peerless Punch & Shear Co.

115 W. Liberty Street, New York.

**BAR IRON SHEARS**

Hand Lever Shears, cutting Flat Bar Iron, 3/4 x 1 in., 5/8 x 3/4, 1/2 x 1; and 1 inch round, smoothly, leaving good ends; weight, 375 lbs.; reduced price, \$65, net. Also, smaller sizes.

These are the most powerful Bar-Iron Shears for Blacksmith work ever invented, while in price they are below any shear of equal capacity in the market.

**PEERLESS PUNCH AND SHEAR CO.,**

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**SHEAR CO.,**

115 W. Liberty Street, New York.

**J. F. WOLLENSAK'S**

PATENT

**Transom Lifter and Lock.**

For all kinds of Transoms, Fanlights and Skylights.

Send for catalogue and price list.

**J. F. WOLLENSAK,**  
Patentee and Sole Manufacturer,  
**CHICAGO, ILL.**

**T. NEW'S**  
PREPARED

**ROOFING**  
For steep or flat roofs. Applied by ordinary workmen at one-third the cost of tin. Circulars and samples free.

**T. NEW, 39 John St., New York.**  
BARRETT, ARNOLD & KIMBALL, Western Agents, Chicago, Ill.

**BLACKSMITHS' FORGES**

(PATTERSON'S PATENT).

Portable or stationary, superior to stone or brick. Can be used with bellows or fan. Send for information to the

**FORGE COMPANY,**

Brooklyn, E. D., N. Y.

**BOSTON.**

Reported by Macomber, Bigelow & Dimes.

Anvils.—"Eagle American"..... \$ 25.00

Avails & Vices..... \$ 25.00

Angus & Blitts, Shell's Auger..... \$ 25.00

Homestead's Ship Auger..... \$ 25.00

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Cook's Bits..... \$ 25.00

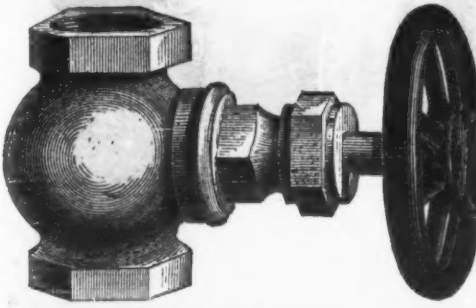
Shepardson's Bits..... \$ 25.00

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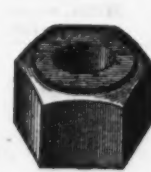


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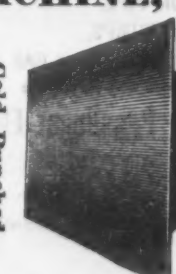

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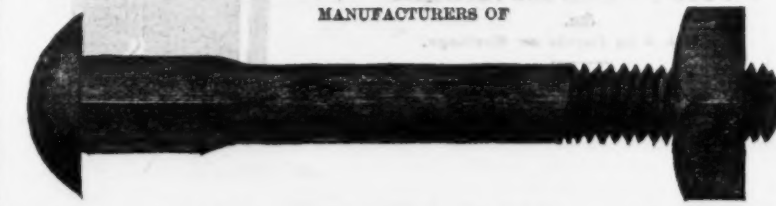

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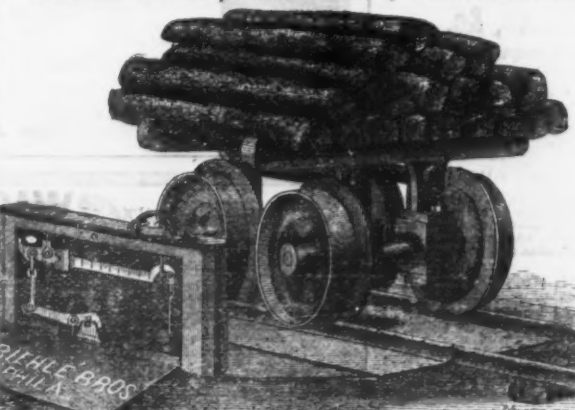

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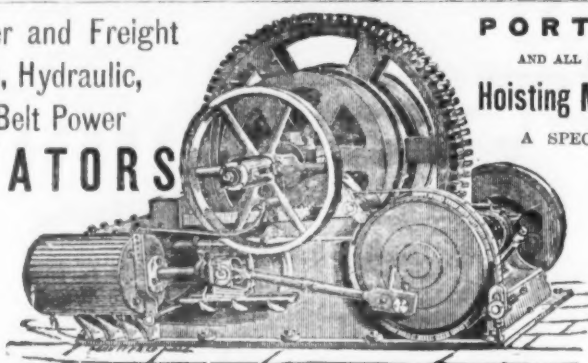
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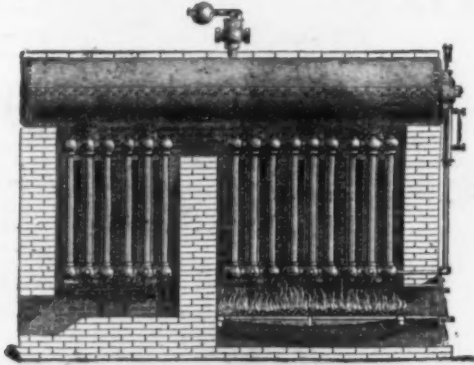
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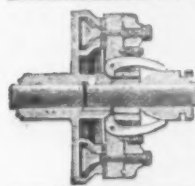
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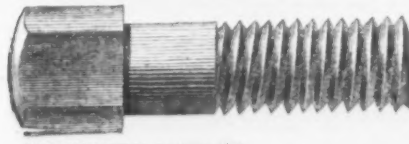


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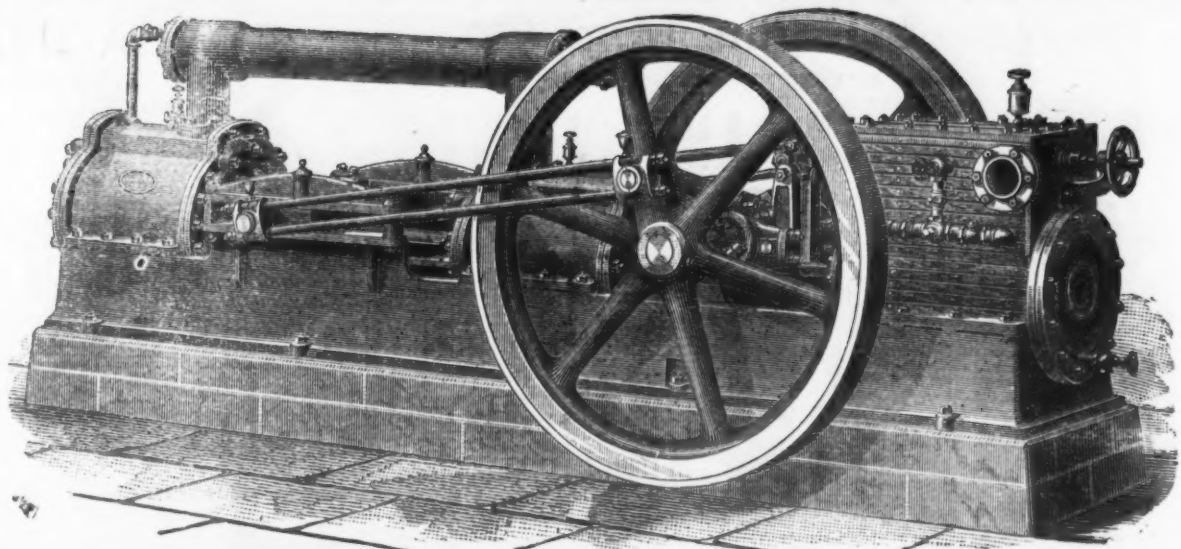
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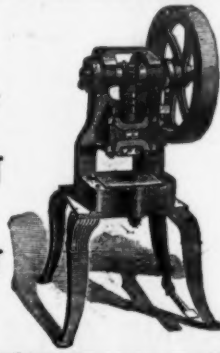
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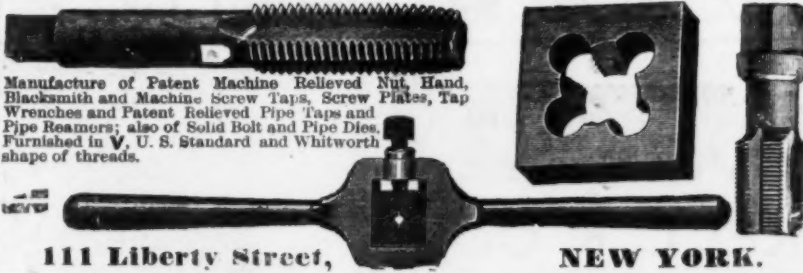
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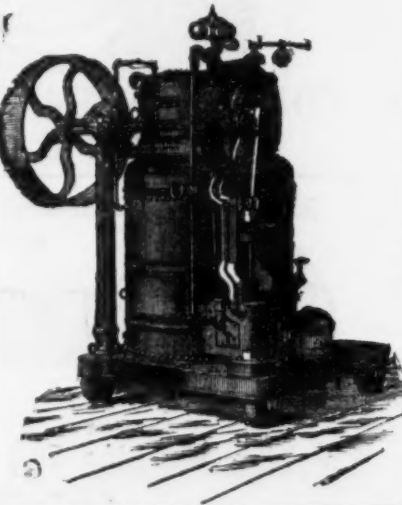
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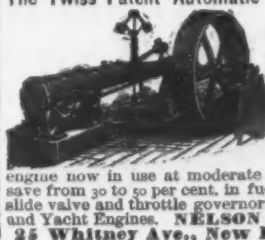
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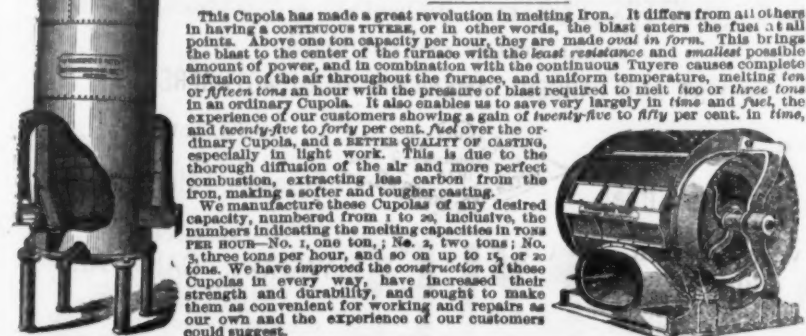
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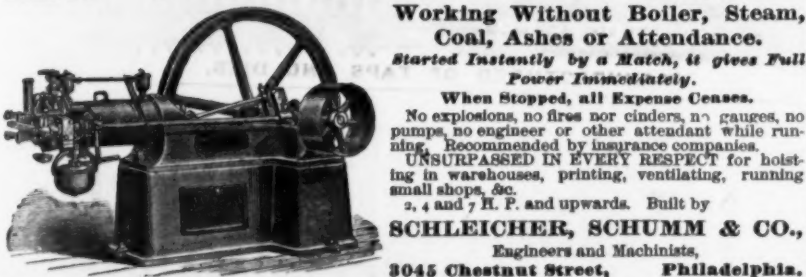
We manufacture these Cupolas of any desired capacity, numbered from 1 to 20, inclusive, the numbers indicating the melting capacities in tons per hour—No. 1, one ton; No. 2, two tons; No. 3, three tons; No. 4, four tons; No. 5, five tons; No. 6, six tons; No. 7, seven tons; No. 8, eight tons; No. 9, nine tons; No. 10, ten tons; No. 11, eleven tons; No. 12, twelve tons; No. 13, thirteen tons; No. 14, fourteen tons; No. 15, fifteen tons; No. 16, sixteen tons; No. 17, seventeen tons; No. 18, eighteen tons; No. 19, nineteen tons; No. 20, twenty tons.

We have improved the construction of these Cupolas in every way, have increased their strength and durability, and sought to make them as convenient for working and repairs as our own and the experience of our customers could suggest.



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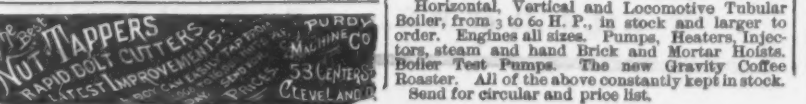


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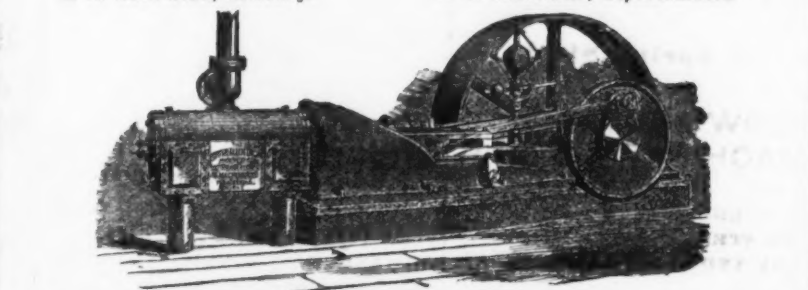
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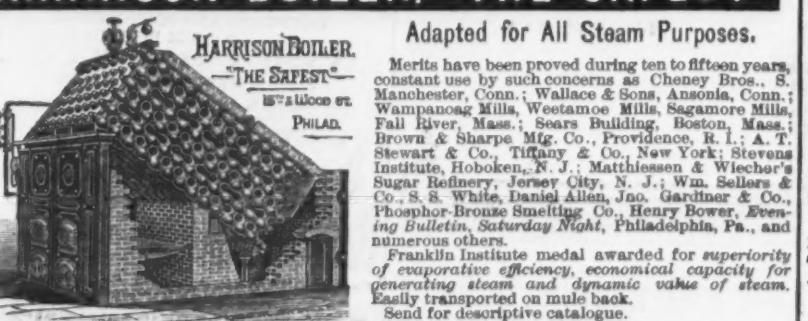
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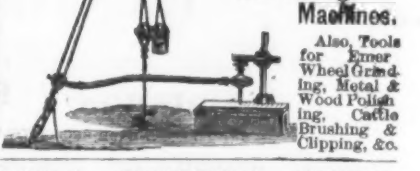
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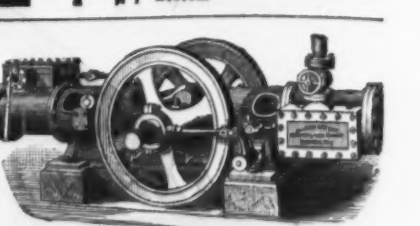


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